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ENERGY CONSERVATION PLAN

PUBLIC LAW 94-163

ENERGY POLICY AND CONSERVATION ACT

GOVERNMENT DOCUMENTS
COLLECTION
MAY 1 1977
University of Massachusetts

SUBMITTED BY:
MASSACHUSETTS ENERGY POLICY OFFICE

MARCH 1977

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THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE DEPARTMENT
STATE HOUSE • BOSTON 02133

MICHAEL S. DUKAKIS
GOVERNOR

March 9, 1977

My Fellow Citizens:

Enclosed is a summary of the state's proposed long-range energy conservation plan, prepared in accordance with the Energy Policy and Conservation Act (Public Law 94-163).

This plan will achieve a reduction in projected energy consumption in 1980 of at least 5 percent, including provisions to satisfy the five mandated items in the federal law (lighting standards for public buildings; carpooling, vanpooling, and public transit; energy efficiency purchasing standards for state and municipal governments; a new, energy efficient building code for new and renovated buildings; and a safe, practical provision for right turns on red light after stopping) as well as proposals for other programs to help reduce energy consumption in the Commonwealth.

This program will bring between $500,000 and $1 million in federal funds into the state annually, and should result in a savings to the state of $250 million in energy costs yearly. For Massachusetts families, this means a savings of $40 per person.

Energy efficiency must become the cornerstone of a comprehensive energy policy for our state. This program will give us the opportunity to begin building such a program coherently and effectively.

Sincerely,

Mike Dukakis

Michael S. Dukakis

MSD:jhl

A. Plan Intent, Overview and Goal

INTRODUCTION

In December of 1975, Congress passed and the President signed the Energy Policy and Conservation Act (Public Law 94-163). Section 365 of that act authorized 150 million dollars for three years to establish state energy conservation programs designed to reduce projected energy consumption in the year 1980 by 5 percent. In July of 1976, the Federal Energy Administration awarded $112,891 to the state of Massachusetts, specifically the Energy Policy Office, to develop state energy conservation plan which, if approved, would then by funded.

This report is the major part of the plan being submitted to the FEA. It contains the rationale and philosophy behind the proposed conservation program for Massachusetts; detailed program descriptions, including proposed milestones and budgets; estimates of energy savings to be accomplished by each program element; and the proposed structural organization of the conservation program.

The Energy Policy Office has determined that the energy conservation program described in this plan will achieve a reduction in projected energy consumption in the year 1980 of at least 5 percent. The plan also includes provisions for satisfying the 5 required items included in the Energy Policy and Conservation Act. These are: 1) mandatory lighting standards for public buildings; 2) programs to promote the availability and use of carpools, vanpools, and public transportation; 3) mandatory standards and policies relating to energy efficiency to govern the procurement practices of the state and its political subdivisions; 4) mandatory thermal efficiency standards and insulation requirements for new and renovated buildings; and 5) a traffic law or regulation, which, to the maximum extent practicable consistent with safety, permits the operator of a motor vehicle to turn such vehicle right at a red light after stopping.

In addition, the plan contains proposals for other programs that will help achieve the required 5 percent goal and a more comprehensive energy conservation program for Massachusetts.

The Energy Policy and Conservation Act encourages the inclusion of such programs by stating that proposed state energy conservation plans may include "programs of public education to promote energy conservation and any other appropriate method or programs to conserve and to improve efficiency in use of energy."

Finally, the plan includes a number of programs which have been completed or are ongoing in Massachusetts, for which funding is not requested at this time. These items are included because they will help the state achieve its energy conservation goal in 1980.

This state plan is written with the realization that a supplementary state energy conservation plan will soon be prepared to meet the requirements of the Energy Conservation and Production Act (Public Law 94-385). The supplemental plan will include provisions for preventing unfair or deceptive practices relating to energy conservation; programs dealing with solar energy and other renewable-resource energy forms; expanded public education programs; and a comprehensive program of energy audits. The plan described herein is written to accomodate the supplemental plan later this year.

As a last word, it should be mentioned that this state energy conservation plan does not include many items of importance to the Commonwealth's energy policy, such as offshore oil, electric power production, and so on. The plan will become one, albeit the key, part of the state's energy policy and is not meant to be all-inclusive.

I. Background and Findings

The Energy Policy Office has spent the last seven months gathering information and data on energy consumption patterns in the commercial and residential sectors--our Project Conserve effort alone has given us a sample of 135,000 homes across the state. Furthermore, our experience with our infra-red camera truck has been invaluable in granting us insights into the problems of heat loss in residential buildings. In the commercial sector, we have sent out questionnaires to 250 retail and commercial businesses inquiring about energy consumption patterns and existing programs to conserve. We have hired the Boston Architectural Center to assist us in surveying office buildings, shopping malls, and apartment buildings.

At the same time the Energy Office was gathering data, we were also discussing possible program elements with representatives from all of the commercial and residential sectors. We met with representatives from over 100 groups and held public hearings in five locations throughout the state. From these meetings, certain basic themes began to emerge.

First, there is a lack of understanding of the value of energy conservation. Much of this problem stems from the way conservation has been packaged and sold. National security arguments and potential shortages 20 years in the future are too abstract and have not and will not convince people to take anything but the most rudimentary long-term actions to change energy consumption patterns. We believe that there is only one argument that will convince people to take the actions necessary to eliminate energy waste--saving money. Reducing energy consumption is one of the most economical investments an individual, company, or even a state can make today.

Many experts are now claiming that it is far cheaper to save a barrel of oil than to produce one. It can also be said that it is far more economical for a consumer to invest in energy conserving materials than to pay money into the purchase of more oil.

We believe that once people understand that energy savings is in their self interest, they will begin to understand two fundamental principles which are the key to a successful energy program--the payback principle and the life-cycle costing principle.

We have found that although most people are very willing to invest their money in savings banks which guarantee a maximum 7 percent return on their investment, they are not willing to invest in energy savings materials which guarantee them a 30 percent return on their investment. (If one purchases $300 of insulation and saves $100 annually on his oil bill, this would come out to a 33 percent return on investment--i.e. there would be a three year payback on the investment). Studies done for the Federal Energy Administration show that most homeowners are reluctant to invest in energy conservation materials which have a payback of more than two years. Furthermore, many commercial users have informed us that one year is their maximum payback period. If people would extend this maximum to five years or a 20 percent return on their investment, we could reduce energy consumption by as much as 50 percent.

Our second principle is that of life-cycle costing. When a person purchases a refrigerator, he pays an initial cost, plus he will pay a certain amount for the operation of that refrigerator over the course of its lifetime. In many instances, those refrigerators which have a low initial cost have a very high operating cost since manufacturers have cut corners to keep their initial costs low. The same is true for a building. During the sixties, the Commonwealth of Massachusetts constructed a lot of inexpensive buildings which are today costing us thousands of dollars to heat and cool.

In the last year, programs such as appliance labeling have been adopted, but purchasing patterns have not changed. Businesses, governments, and individuals are still only considering initial costs. If this practice can be changed, not only will substantial amounts of energy be saved but a clear signal will be sent to the building, automobile, and appliance industries.

We have also learned two other facts from our discussions with interested groups. First, many people do not understand the potential for energy savings in their buildings, their businesses, or their homes. They do not know what they can or should be doing to reduce their consumption of energy. Secondly, we have been cognizant of numerous institutional problems which are obstacles to energy savings. For example, hospital managers claim that existing rules and regulations governing the setting of their rates provide a financial disincentive to eliminate energy waste.

The Energy Policy Office has taken these to findings--i.e. the need to understand the payback principle and the life-cycle costing principle, the need to teach people how to save energy, and the need to remove institutional barriers--and from these findings we have tried to fashion a generalized energy conservation strategy, the elements of which are outlined in the following pages.

First, however, we shall discuss the general philosophy and rationale for the programs included in the plan. Then the organizational structure and overall budget implementing the plan will be described. Finally, detailed program descriptions will be given.

II. Program Philosophy and Rationale

An implicit principal of this plan is that there is an appropriate role for the state government in encouraging energy conservation. It is our feeling that the commitment of the state government is an essential aspect of any energy conservation program and that the state has an obligation to its citizens to promote energy conservation as an integral part of the state's energy policy.

A. Commercial Sector

The commercial sector will be the main focus of the state's energy conservation plan for several reasons. First, the potential for energy savings appears to be greatest in this sector. Commercial enterprises use the largest share of energy in the state, and yet they have had the poorest performance in terms of reducing energy use.

Second, although there are strong monetary incentives for commercial users to reduce energy consumption, there appear to be a number of institutional constraints that block firms from taking advantage of energy savings improvements.

It is felt that the state conservation program could help to remove some of these institutional problems.

Third, there are a large number of cost-effective conservation measures that can improve the productivity and profitability of firms in the state. A strong conservation program can thus have a positive effect on individual businesses and on the state's economy in general.

Fourth, reduction of energy use by certain firms and groups--hospitals, supermarkets, municipal buildings--can result in lower costs of services and goods and lower taxes for consumers and taxpayers.

Finally, the inefficient use of energy in the commercial sector presents a highly visible bad example and causes resentment on the part of individuals and families in the state.

The central theme of the entire energy conservation plan, but especially the commercial sector of the plan, is that saving energy can be accomplished while retaining or increasing business activity and profitability, that energy conservation is a good investment and sound business practice. Initial investments in conservation equipment or techniques often have a payback period of three years or less, corresponding to rate of return on investment of 33 percent or better.

Another theme of the commercial sector program is a strong stress on education of energy users. Although some large energy users need no additional knowledge to achieve energy savings, many large users and most small commercial users are aware of only a few of the simpler cost-effective conservation measures available to them. Educating energy consumers will in many cases result in voluntary energy savings. This state plan is heavily dependent on voluntary actions to achieve its goal of energy savings over the next four years.

B. Residential Sector

The purpose of state and federal residential energy conservation programs over the past two years has been to increase consumer awareness of the benefits and importance of saving energy and to educate households in simple, cost-effective conservation measures. For example, Project Conserve provided homeowners in the Commonwealth with individualized computer analyses of their houses and suggested energy-related home improvements. This questionnaire program was accompanied by a van ("Red Rover") which provided many homeowners with infrared pictures of dwellings to highlight areas of heat loss; by a mobile conservation exhibit ("The Little House of Big Energy Savings") which displayed different forms of insulation and other energy-saving materials; and by adult education courses in many of the cities and towns of the state.

The success of Project Conserve as a public education and awareness program, with over 135,000 homeowners participating, indicates a strong interest on the part of consumers in saving energy and saving money. It is the intent of this state energy conservation plan to build on this interest with further education and assistance programs. The rationale for this approach is that residential consumers of energy will, with adequate and unbiased information, take steps to save energy and money and to make their houses and apartments more comfortable places in which to live.

While public education programs are essential aspects of the residential conservation plan, other ideas are also under consideration. The use of tax incentives can help homeowners overcome the initial costs of some conservation measures or can enhance the year-to-year benefits of energy saving equipment. Enforcement and changes in state regulations can also contribute to long-term energy savings. These ideas will be intensively evaluated as part of the conservation program.

This section on the residential sector is included in the state energy conservation plan for two reasons. The first is that houses and small apartment buildings use 280 trillion BTU's per year, or almost 24 percent of the energy consumed in the state. This is a substantial portion of the state's energy use and deserves special consideration.

The second reason is equally basic. Every person in the state is a member of the residential sector and, as such, stands to benefit from energy savings programs. It is appropriate that the plan contain elements that have the potential to assist such a wide spectrum of citizens in the Commonwealth to save energy and money.

C. Transportation

Thirty percent of all the energy consumed in Massachusetts is used for transportation. Gasoline for private automobiles is the major component of this figure, and so this plan is directed at reducing energy usage in these vehicles.

There are three major ways to reduce gasoline consumption. One strategy is to discourage unnecessary driving. Another is to reduce the number of cars on the roads during rush hours. The third is to make cars more efficient. The programs outlined below are directed towards these goals.

Decreasing the number of cars on the highway at rush hours is possible, although difficult to do. The reasons for the difficulty are obvious. For most people, living and working in the suburbs, mass transit is usually not a feasible option; for people working in downtown areas, the car may take less time, be more comfortable, or offer more flexibility than can the present form of mass transit. Making mass transit more attractive to riders, though it offers many benefits and is strongly supported by the state, has not had large success in drawing riders from their cars. Furthermore, it takes many years to expand the existing transit system, as witnessed by delays in MBTA extension projects.

Nevertheless, there seems to be at least one strategy which shows considerable promise in lessening the number of single occupant cars on the road at rush hour, and which is currently being implemented on a demonstration program basis. The strategy is a voluntary, state-assisted carpool/vanpool program (Masspool) in which workers with the same living and working places are matched

Other strategies to save energy in the transportation area include improvi the efficiency of automobiles already on the highway, or promoting the purchase and use of more efficient automobiles. Programs in this area do not need any change in travel behavior to be successful.

The proposals detailed in the plan accept the fact that many drivers have no alternative to the automobile in their trips to work. For this reason, the aggregate energy savings in the transportation area due to the state effort will probably be not as great as the other sectors. Furthermore, federal programs (most notably the requirement that new car fleets average 20.0 miles per gallon in 1980, and 27.5 miles per gallon in 1985) have to an extent preempted the states and will result in substantial fuel savings over the next several years.

III. Organizational Structure

The Massachusetts Energy Conservation Program will be directed by the state's Energy Policy Office. Some of the programs included in the plan will be run by the Energy Policy Office, others will be implemented by other state agencies, including the Department of Community Affairs, the Executive Office of Transportation and Construction, the State Building Code Commission, the Department of Environmental Quality Engineering, and the Executive Office of Consumer Affairs.

The program will be administered by a Program Director, with the assistance of an administrative and legal staff. The Energy Conservation Extension Service, and the Division of Program and Policy Development, will be administered by staff within the Energy Policy Office. The Public Education Program will be administered by Energy Policy Office staff in cooperation with staff from the Executive Office of Consumer Affairs. The State Building Code Commission will hold responsibility for the programs relating to lighting and thermal standards for buildings. The Executive Office of Transportation and Construction will be responsible for the carpool/vanpool program. The Department of Community Affairs will implement the programs for public housing and weatherization of low-income homes. The Waste Oil Program will be administered by the Department of Environmental Quality Engineering.

All agencies involved in the plan will have representatives on an ongoing Working Committee that will help ensure communication among the departments.

An Advisory Committee, composed of interested citizens from a variety of interest groups and geographical areas will advise the Energy Policy Office on matters relating to conservation. Besides serving in a general advisory and review capacity, members of the Advisory Committee will be asked to serve on selected task forces. These task forces, outlined in the plan, will investigate possible legislation and/or regulations concerning mandatory standards and other issues.

Included below is an organizational chart showing the organizational structure for the state energy conservation plan. As mentioned, this structure has been designed to implement the state energy conservation plan but is designed also to meet the requirements of the supplemental state plan.

REQUIRED PROGRAM MEASURES

This section describes how Massachusetts will fulfill the five program measures required to be included in the state energy conservation plan. These requirements are included in the Energy Policy and Conservation Act, Section 362(c).

E0100. MANDATORY LIGHTING STANDARDS

E0110. PROGRAM OVERVIEW

I. General Program Description

This program will satisfy the requirement of Public Law 94-163, that the state energy conservation plan include "mandatory lighting efficiency standards for public buildings."

The state Building Code Commission currently has the authority to promulgate such standards. Funding under the proposal will enable the Building Code Commission to hire professional staff so that the lighting standards will be developed and promulgated and will meet the minimum criteria set forth in CFR Part 420, Chapter II of Title 10, viz:

(1) Be in place and ready for implementation throughout all political subdivisions of the state by January 1, 1978;

(2) Apply to all public buildings above a certain size, as determined by the state;

(3) For new public buildings, be no less stringent than a standard consistent with the provisions of Section 9 of ASHRAE 90-75; and

(4) For existing public buildings, contain elements deemed appropriate by the state.

II. Detailed Program Description

A. Legal Feasibility

The powers and duties necessary for a lighting standards program are presently available to the State Building Code Commission. These powers and duties are defined in S.17 of C.23 B of the General laws, in order to effectuate objectives outlined in S.18 of the same chapter.

The specific authority lies in clause (b) of S.18. It states that the Commission shall exercise its powers and duties so as to adopt "modern technical methods, devices, and improvements which may reduce the cost of...maintenance over the life of the building."

B. General Feasibility

A lighting standards program may be among the most difficult of EPCA programs. It requires that a standards be developed that are sensitive to the range of lighting needs in a wide variety of buildings, including stores, institutional, educational, and government buildings. Lighting levels in these buildings are affected by the needs of marketing appeal, worker productivity, as well as health and safety. Also, the quality of the light is of concern to commercial establishments, and at times, the output of inefficient incandesent bulbs may be preferred to more efficient equipment.

Although this program will produce mandatory lighting standards, it is hoped that the program can be implemented with a minimum of regulation and enforcement. It is clearly not feasible to attempt standards that will encounter strong resistance from the commercial sector. The expenses that would be encountered in enforcement would be prohibitive. Therefore, the program will mainly be one of developing concensus, and then providing guidance in implementation, rather than enforcement.

An enforcement procedure will likely be required under EPCA, however. Again, the entire program should be designed to result in infrequent punitive enforcement.

C. Implementation Plan

- Where relevant

Standards will be for the following building types:

(1) any building providing facilities or shelter for public assembly, or which is used for educational, office, or institutional purposes, with floor area in excess of 10,000 square feet.

(2) any inn, hotel, motel, sports arena, transportation terminal, retail store, restaurant, or other commercial establishment which provides services or retail merchandise, with floor area in excess of 10,000 square feet.

(3) any portion of an industrial plant used primarily as office space, provided the office area is in excess of 10,000 square feet.

(4) any building owned by state, county, city, or town.

- Procedures for promulgation of standards

(1) The State Building Code Commission will hire one individual to be "lighting standards coordinator," with background in engineering and management. His involvement with lighting standards would be a half-time duty.

(2) The coordinator will establish and convene a Lighting Standards Committee. The membership will include four sub-groups.

  (a) representatives of commerce, and commercial real estate,

  (b) representatives of state, city, and county governments,

  (c) representatives of schools, hospitals, and other major institutions,

  (d) the membership of the existing energy standards committee.

(3) The coordinator, with the assistance of consultants, will prepare draft lighting standards, with options, in four parts:

  (a) for existing commercial and office buildings,

  (b) for existing government buildings,

  (c) for existing special institution buildings,

  (d) for new buildings (but to be no less stringent than those of ASHRAE 90-75)

(4) The appropriate sub-group will review the draft standards, and propose changes as needed. The Coordinator will prepare updates of the standards as needed.

(5) The coordinator will prepare a final draft, and will present them to public hearing and the State Building Code Commission for approval.

(6) After approval, the coordinator will assume a full-time position, in charge of implementation of the Lighting Standards Program. He will supervise the development of an information center and the dispension of materials to affected establishments.

(7) The coordinator will hire a technical guidance staff that will review and advise public buildings on how to achieve the standard.

(8) The coordinator will provide on-going monitoring of lighting standard results.

E0200. PROMOTION OF CARPOOLS AND VANPOOLS

E0210. PROGRAM DESCRIPTION

I. General Program Description

This program will satisfy the requirement of Public Law 94-163 that the state energy conservation plan include "programs to promote the availability and use of carpools, vanpools, and public transportation."

Under this proposal, the state will maintain and expand its existing carpool/vanpool technical assistance and promotional program to meet the regulations set forth in Section 420. The program will be run by the Executive Office of Transportation and Construction and will, by January 1, 1978, have in place at least one urbanized area a carpool/vanpool matching and promotion campaign and will be coordinated with the relevant Metropolitan Planning Organization and will not be inconsistent with any applicable federal requirements.

II. Detailed Program Description

The Commonwealth has introduced a statewide carpool/vanpool technical assistance and promotional program for employers of 250 or more persons. The MASSPOOL program began in January, 1976, and was funded (90%) by Federal Highway Administration carpool demonstration project monies which will expire in July, 1977. The program has developed and distributed to interested employers all necessary materials (i.e., carpool and vanpool "how-to" handbooks,employee brochures, matching maps, questionnairès, posters and other promotional materials) to initiate and maintain a successful employer-based ride-sharing program. On-site technical assistance to any interested employer of 250 or more people was offered to explain the benefits and steps involved in starting up a carpool or vanpool program in any large organization. The MASSPOOL program sponsored and directed by the Massachusetts Executive Office of Transportation and Construction (EOTC) and the Department of Public Works (DPW) and has been carried out by a consultant team under contract to the DPW.

During the initial demonstration program, most employers of 250 or more persons in the Commonwealth have been contacted and introduced to the MASSPOOL program. However, as is inevitable in the first try at such a broadly based program, there are variations in the levels of employer participation at this date. A significant difference in employer participation exists between the Boston Air Quality Control Region (roughly the area within Interstate Route 495) and the remainder of the Commonwealth, due largely the the existence of U.S. Environmental Protection Agency regulations requiring employers with 250 or more employees to maintain a carpool program in the Boston Region.

The Commonwealth's Department of Environmental Quality Engineering has recently announced its intentions to promulgate regulations similar to the EPA's Boston regulation requiring all large employers (greater than 250 employees) to maintain an active carpool program and all employers of 1,000 or more persons to offer a vanpool program for their employees. Such action by the Commonwealth will undoubtedly spur renewed interest in the MASSPOOL program statewide and insure that future ride-sharing efforts will be most cost effective.

In summary a continuing effort is required to broaden participation by employers and employees in the carpool/vanpool program implementation, and to help firms maintain current ride-sharing files (i.e., updating employee matches on a regular basis). Experience has also shown that the vanpool concept is considered unusual and highly innovative to newly-initiated employers and that substantial follow-up assistance is needed to get a new vanpool program in operation. Also, ride-sharing programs for groups of smaller employers (e.g., industrial parks) have not yet been coordinated to any significant degree.

Federal, state and local government agencies have also posed special problems in the area of ride-sharing for the MASSPOOL staff (not the least of which is multi-agency coordination within the same or nearby facilities) and most problems with governmental agencies have yet to be resolved so that on-going governmental employee ride-sharing programs may become a reality.

The program outlined in Section III below shows how FEA funding (along with the possibility of other funding yet to be identified) will be used to continue the Commonwealth's MASSPOOL program in the manner just described.

III. Work Program

The continuation of the MASSPOOL program will be directed by the Executive Office of Transportation and Construction. During the first eight months (May 76 - December 77) permanent and individual "03" consultant staff will undertake the following functions:

- Examine, comment and elaborate on the FHWA-funded evaluation of the initial MASSPOOL demonstration program.
- Prioritize large employers requiring additional telephone and/or on-site technical assistance and carry out such assistance by priority group.
- Identify groups of smaller employers with potential to initiate joint ride-sharing programs.
- Develop a strategy for organizing state and local government ride-sharing programs, including public agency vanpooling and begin implementation of such a program.
- Identify other possible funding sources and draft a scope of services for a consultant contract to provide further on-site technical assistance in 1978.
- Inventory existing stock of ride-sharing materials and identify deficiencies or additional publications to be developed for future distribution, this probably will include at least one statewide MASSPOOL newsletter during 1978.
- Provide continuing ride-sharing assistance to large employers as time allows, utilizing, if possible, Department of Commerce and Development industrial field staff in addition to EOTC staff.

Implementation of the strategies identified during 1977 by the EOTC staff will be accelerated during 1978 through the use of a consultant contract for further on-site employer assistance. Priority will be placed on providing a well-defined vanpooling promotional program for public as well as private sector employers, providing assistance to those employers identified previously as having the greatest potential for carpool formation and developing and maintaining an appropriate matching file update procedure for fully implemented employees program. At least one EOTC staff person will work primarily on state and local government employee ride-sharing programs. Computer carpool matching services will continue to be offered using the MDPW computer at no cost when computer time is available. An on-going monitoring and evaluation program (described in section IV below) will allow program adjustments to maximize the effectiveness of the ride-sharing program resources. At the present time, it is anticipated that the level of effort planned for 1978 will be required each year to maintain a viable, effective statewide ride-sharing program through 1980.

E0300. MANDATORY ENERGY-EFFICIENT PROCUREMENT STANDARDS AND POLICIES

E0310. PROGRAM OVERVIEW

I. General Program Description

This program will satisfy the requirement of Public Law 94-163 that the state energy conservation plan include "mandatory standards and policies relating to energy efficiency to govern the procurement practices of such state and its political subdivisions."

The Commissioner of Administration and Finance will promulgate said standards and policies by January 1, 1978, as required in Section 420. The standards and policies will contain the elements deemed appropriate by the state to improve energy efficiency through the procurement practices of the state and its political subdivisions. The Commissioner will be advised in this matter by the Division of Program and Policy Development in the Energy Policy Office. Funding for the effort will thus be included in the staff requirements for that Division.

II. Detailed Program Description

The FEA guidelines specify that energy-efficient procurement policies and standards must be developed for all State procurement and for procurement by subdivisions to the extent feasible. Under existing law, 7 M.G.L.A. s. 22, the Commissioner of Administration has the authority to make rules and regulations governing the manner and method of purchasing for the various state departments, offices, and commissions. The Commissioner is specifically authorized to promulgate regulations dealing with the standardization of specifications for purchasing supplies, equipment, and other property. Any regulations adopted by the Commissioner would be binding on the Purchasing Agent's Division of the Executive Office of Administration and Finance, which has sole responsibility for the Commonwealth for the actual contracting or purchase of all supplies needed in the operation of state government and associated state agencies. In summary, the Commissioner has the authority to implement mandatory energy efficient procurement policies with respect to state purchases.

With respect to political subdivisions, the Bureau of Collective Purchasing, within the Purchasing Agent's Division, has the authority pursuant to Chapter 7, Section 4A of the Massachusetts General Laws, to make collective purchases in cities, towns, districts, counties, or authorities. The Collective Purchasing Act, 7 M.G.L.A. ss 22A and 22B, specifically authorizes political subdivisions to participate in state contracts. Any energy-efficient procurement standards or policies adopted by the Commissioner of Administration or by the State Purchasing Agent would therefore be binding on political subdivisions to the extent that the political subdivisions participate in state contracts.

The overriding objectives of the Commonwealth's mandatory procurement plan are to reduce long-run costs by utilizing energy-efficient products and to promote the production of energy-efficient products by utilizing the demand-altering power of the large governmental purchases involved.

There are basically two ways in which the development of procurement standards may be approached. One approach involves a product by product analysis, where the completed standards reflect product specifications that are deemed to contribute to energy conservation. The second approach is to develop a methodology that will allow the purchaser, assuming adequate data and data evaluation capabilities, to systematically compare the long-run costs and energy-efficiency of two products and possibly of two brands of the same product. The Commonwealth of Massachusetts is particularly enthusiastic about this latter, life-cycle costing approach as it involves the consideration not only of the initial cost of the product, but also of the costs of maintaining, servicing, providing with energy, and otherwise operating that product over its entire lifespan. Under this approach, a product which may have a higher initial cost but which promises longer life with fewer servicing and operational requirements becomes viable since the total cost of the product over its useful life may prove to be considerably less when compared with an initially less expensive product.

The obvious disadvantage of the life-cycle cost method is the enormous amount of information required for each product and between competing products. The most troubling components from this data perspective for competing products. and estimates of maintenance costs. Another possible concern is whether or not life-cycle costing can be successfully applied to the Commonwealth's procurement system since procurement activities in the Commonwealth are somewhat fragmented. Based on preliminary research, it appears that any implementation of life-cycle cost behavior will have to be made through the individual state agencies, for it is the agencies that draw up the actual product specifications--the central state purchasing agency merely acts as a centralized bidder of contracts.

The Commonwealth of Massachusetts, as part of its plan, will continue to research the feasibility of applying life-cycle costing to state purchasing activities and will identify those products to which this criteria can be most successfully applied. Massachusetts feels that the flexibility allowed by EPCA and the FEA guidelines in the procurement area will give it an opportunity to make some significant and well-considered changes in its purchasing practices. The Energy Policy Office, Division of Policy and Program Development will perform the research as needed for this program and will submit recommendations for procurement standards and policies to the Commissioner for implementation.

Implementation Plan

A. A comprehensive review will be made of energy efficiency standards and life-cycle costing criteria developed at the federal level e.g. the General Services Administration and the Bureau of Standards have done some preliminary work with procurement standards as part of the Experimental Technology Incentives Program (ETIP). This review will also encompass available indices dealing with the amount of energy expended in the manufacture of particular products. Further research will be conducted to determine the feasibility of applying life-cycle costing criteria to Massachusetts procurement activities.

B. Meetings will be arranged with the heads of several large state agencies and state colleges and universities to determine exactly what is purchased by these agencies, the quantity, and the dollar amount. This determination will be made both as to contract and non-contract items. Specific comments and concerns of the agencies with respect to the implementation of energy-efficiency standards, life-cycle costing formulas, or some combination will be noted. An investigation will be made of the legal ramifications of awarding state contracts on other than a "lowest first cost" basis and the necessary legal changes will be initiated.

C. Develop a list of items purchased by the state, to which either energy-efficiency standards/ life-cycle formulas will be applied. List may also include items which use large amounts of energy per unit in manufacturing. List will be derived from review of items purchased by state contract, by collective purchasing, and by requisition. As many items as possible on the centralized state contract/collective purchasing list will be selected so as to include political subdivisions to the maximum extent possible in the plan. List will be sent to several of the largest state agencies for comment and approval.

D. Efforts will be coordinated whenever possible with the Task Force on Cooperative Purchasing formed by the Massachusetts League of Cities and Towns. The Task Force has a number of priority items which they plan to add to the centralized list of state contracts. Of particular interest are passenger cars and trucks.

E. Develop energy standards or formulas for applicable items. Standards on formulas will be sent to several of the largest state agencies for comment and approval.

F. Executive Order from Commissioner of Administration and Finance will be sent to the heads of the 200 state agencies and to state colleges and universities mandating energy-efficient procurement practices and outlining purchasing criteria for selected products.

G. A further, in-depth survey will be made of items purchased by the state, to which either energy-efficient standards, life-cycle formulas can be applied. Particular emphasis will be placed on selecting items on the centralized state contract/collective purchasing list so as to include political subdivisions to the maximum extent possible in the plan. List will be sent to several of the largest state agencies for comment and approval.

H. Coordinate efforts with the Task Force on Cooperative Purchasing with the intent of adding new items susceptible to energy-efficient procurement criteria to the state contract/collective purchasing list.

I. Prepare case studies outlining state's experience with either energy-efficient standards or life-cycle costing and distribute to state agencies and to political subdivisions.

J. Develop energy standards or formulas for items selected pursuant to Step G. Standards or formulas will be sent to several of the largest state agencies for comment and approval.

K. Executive Order from Commissioner of Administration and Finance will be sent to the heads of the 200 state agencies and to state colleges and universities mandating energy-efficient procurement criteria for selected items.

Continue to expand list of state purchases to which energy-efficient procurement criteria can be applied and continue close working relationship with

E0400 THERMAL EFFICIENCY STANDARDS FOR NEW BUILDINGS

E0410 Program Overview

I. General Program Description

This program will satisfy the requirement of Public Law 94-163, that the State energy conservation plan include "mandatory thermal efficiency standards and insulation requirements for new and renovated buildings."

The state Building Code Commission has the statutory authority to promulgate said standards and would receive funding under this proposal for professional staff to meet the requirements of Section 420, viz:

1. be in place and ready for implementation with respect to all buildings other than exempted buildings throughout all political subdivisions of the State by January 1, 1978.

2. take into account the exterior envelope physical characteristics, HVAC system selection and configuration, HVAC equipment performance and service water heating design and equipment selection;

3. for all new non-residential buildings, be no less stringent than a standard consistent with provisions of Sections 4-9 of ASHRAE 90-75;

4. for all new residential buildings, be no less stringent that either the HUD minimum property standards or a standard consistent with the provisions of Sections 4-9 of ASHRAE 90-75; and

5. for renovated buildings, (1) apply to those buildings determined by the State to be renovated buildings; and (2) contain the elements deemed appropriate by the State regarding thermal efficiency standards for renovated buildings.

the Task Force on Cooperative Purchasing. Continue to utilize case study method as a means of making political subdivisions aware of the energy and cost savings that can be realized through implementation of energy-efficient procurement standards. Explore the possibility of setting up a "pilot" energy-efficient procurement program in one or more of the Commonwealth's political subdivisions.

II. Detailed Program Description

Massachusetts will undertake the promulgation and enforcement of standards to improve the thermal and lighting efficiency characteristics of new construction. This step will result in major energy savings to the Commonwealth, due to the reduced demands for energy in new buildings.

The legal capability to promulgate standards for new construction rests in the Massachusetts Building Code Commission. The scope of these standards may include measures which "reduce the cost of ... maintenence over the life of the building." (Chapter 23B, S.18b, clause 6 of the Massachusetts General Laws.)

The State Building Code Commission is already in the process of developing adoptable energy conservation regulations. It is preparing a schedule for adoption by the Commission; and is developing orientation materials and seminars for building officials and design professionals.

Since one-third of all of the building officials in Massachusetts serve on a part-time basis and, due to the varied backgrounds of the building officials, it may be that many of them will not be able to perform the necessary plan reviews, particularly for the more complex structures. Consequently, in order to assist the local building officials and to respond to inquiries from the design professionals, the SBCC must have the ability to provide in-depth technical assistance to various sectors of the Commonwealth. With this technical expertise, the SBCC will be able to assist the building code community in implementing these standards. By developing a broad base of support for the regulations, the program can become an effective method of energy conservation with a minimum of punitive enforcement.

The Building Code Commission will therefore undertake the following activities in implementing energy conserving building standards in Massachusetts.

a) They will complete a clear statement of enforceable energy regulations in code language understandable by architects, engineers, developers and building code officials responsible for enforcement of building codes.

b) The implementable code document will be taken through the State hearing process.

c) Materials will be made available to building inspectors, and seminars will be undertaken to develop a clear understanding on the part of building code officials of the requirements of the energy code provisions and the method and techniques of plan review, field inspection, and enforcement.

d) Assistance to local building officials will continue in an ongoing manner. Activities will include a State design review staff, which will review large or complex buildings, if requested by local officials. Also, the Building Code Commission will operate an information center to provide a qualified central source of information to handle questions regarding interpretation of energy code provisions.

The building code adopted by the Building Code Commission will meet the mandatory requirements outlined in SECP regulations, namely:

1. be in place and ready for implementation with respect to all buildings other than exempted buildings throughout all political subdivisions of the State by January 1, 1978 unless an extension of time has been granted by FEA under 420.41 (b);
2. take into account the exterior envelope physical characteristics, HVAC system selection and configuration, HVAC equipment selection;
3. for all new non-residential buildings, be no less stringent than a standard consistent with provisions of sections 4-9 of ASHRAE 90-75;
4. for all new residential buildings, be no less stringent than either the HUD Minimum Property Standards or a standard consistent with the provisions of sections 4-9 of ASHRAE 90-75; and
5. for renovated buildings, (1) apply to those buildings determined by the State to be renovated buildings; and (ii) contain the elements deemed appropriate by the State regarding thermal efficiency standards for renovated buildings.

III. Implementation Procedure

Task I: Develop Energy Regulation and an Implementation Plan

Purpose:

Amend Massachusetts State Building Code to reflect the most effective enforceable energy standards available.

Activities:

a) Review available energy standards and model energy code provisions - ASHRAE 90-75, HUD MPS, BOCA amendments, CABO;

b) Adapt standards and model code provisions to be compatible with Mass. State Building Code;

c) Review and comment by Energy Standards Committee of State Building Code Commission and State Energy Policy Office.

d) Hold informational hearings on energy code provisions.

Task II: Develop and Organize Orientation Seminars

Purpose:

To provide basic understanding of recommended Mass. State Building Code provisions to concerned building code officials charged with enforcement of standards.

Activities:

a) Review available general training materials such as ASHRAE seminars, Model Code Group material, material being developed under the NCSBCS ERDA contract and the like;

b) Adapt available materials, develop new materials as needed for specific application to Massachusetts conditions;

c) Incorporate training into existing SBCC training programs.

Task III: Establish Energy Technical Information Center

Purpose:

Provide the SBCC with the ability to handle the multitude of questions which will come up with regard to interpretation of energy code provisions on the part of building inspectors, engineers, architects.

Activities:

Respond to inquiries, analyze areas of the code which provide the greatest field problems.

Task IV: Establish Design Review Staff

Purpose:

To provide ongoing assistance to local building officials in building code implementation and compliance review.

Activities:

a) Hire three professionals in the State Building Code Commission to establish the "technical energy assistance task force". Members will have backgrounds in engineering, architecture and administration.

b) The Task Force will review and comment on voluntarily submitted structural plans to determine areas of potential non-compliance with the energy conservation regulations.

c) The Task Force will conduct seminars with professional groups, building representatives, state and local officials.

d) The Task Force will engage in on-going monitoring and evaluation of the effects of the energy conservation regulations.

d) The SBCC will file periodic progress reports.

E0500 RIGHT TURN ON RED LIGHT

E0510 Program Overview

I. General Program Description

This program will satisfy the requirement of Public Law 94-163, that the state energy conservation plan include "a traffic law or regulation which, to the maximum extent practicable consistent with safety, permits the operator of a motor vehicle to turn such vehicle right at a red stop light after stopping."

As described below, the state Department of Public Works has determined that, with respect to its jurisdiction, permitting a right turn at a red traffic light only where specifically authorized by a traffic sign permits right-turn-on-red after stopping to the maximum extent practicable consistent with safety. Regulations to this effect were promulgated on November 19, 1976, thus satisfying Section 420 that regulations be included in the state's motor vehicle code and be ready for implementation throughout all political subdivisions by January 1, 1978.

II. Detailed Program Description

A. Legal Feasibility

The Rules and Regulations for driving on State Highways were amended on November 19, 1976 in accordance with the provisions of Chapter 85, Section 2 of the Massachusetts General Laws to allow a right turn after stopping at a steady circular red signal when a sign is in place permitting such a turn. A copy of the amendment as passed is attached.

B. General Feasibility

A recent review has indicated that 80 percent of those signals not on the State Highway System have exclusive pedestrian phases. This equates to 1,975 locations or 64 percent of all signals in the Commonwealth. These locations must prohibit RTOR because the nature of an exclusive pedestrian phase and the safety hazard associated with the turn into an intersection marked "safe" for the pedestrian. In the Commonwealth there are 3,100 signalized intersections. Of these, 625 are located on State Highway and 2,475 on local (city or town) roadways. Approximately 40 percent or 250 of the State Highway locations can be modified for RTOR. However, because of the urban confines of the location of the local signals (2,475), it has been estimated that only 10 percent (250) of these could provide for RTOR under both FHWA and DPW guidelines. This then means that about 500 locations out of the 3,100 possible signalized intersections are eligible for signing permitting a right turn on red after stopping.

C. Proposal for Implementation

Warrants for determining the feasibility of RTOR at specific intersections were approved by the Department of Public Works Commissioners on August 11, 1976. A copy of these warrants are attached (#39). As indicated, a traffic study must be undertaken for each intersection prior to the placing of signs. These studies are in the process of implementation during 1977-78 and RTOR will be implemented as appropriate. Control over local street intersections ultimately rests with the local city or town government which will make a final implementation decision in those cases.

E0600 ENERGY CONSERVATION EXTENSION SERVICE

E0610 Program Overview

I. General Program Description

The Energy Conservation Extension Service program will provide energy conservation training, assistance, and associated services to the commercial sector. The primary focus of the program is to bring about energy savings by informing and assisting the commercial sector in techniques of energy management. (The commercial sector is defined here as both public and private nonresidential structures). There will be instruction in the use of effective energy management schemes to bring about both "first level" energy conservation, i.e. low-cost or no-cost actions with a short payback period and "second level" measures, i.e. more sophisticated capital improvements and control systems. The Service will also serve as an information referral center for specific questions by members of the commercial sector.

The Conservation Extension Service program will be tailored to meet the specific needs of the various subsectors of the commercial sector. Background information on energy use by each subsector will be compiled to be used as reference material for the training program, and manuals and brochures will be printed as necessary.

During the first year of the program, two teams of technically qualified people will implement the program, one team directing its efforts in the eastern part of the state, and the other team focusing on the western part. In following years, additional teams and personnel will be added to provide expanded service.

The Extension Service teams will have at their disposal a sum of money to develop energy conservation materials to help inform the various subsectors of the commercial sector about energy management techniques and energy conservation measures. This fund will be used to conduct demonstration projects, pilot studies, and technical analyses that will form the basis for brochures, manuals, and other educational materials. Funds are also allocated for printing and distribution costs.

In short, the purpose of the Extension Service is to serve as a resource to the commercial sector to help members of that sector save energy. During the first year, priority will be given to state-owned buildings, municipal facilities, large office buildings, and retail establishments.
In following years, additional subsectors (hotels, sports facilities, small office buildings, colleges, universities, warehouses, etc.) will be covered. The program is explained in more detail below.

II. Detailed Program Description

A. Introduction

The Energy Conservation Extension Service program will be directed by the Conservation Staff Director in the Energy Policy Office. Reporting to this person will be the Conservation Extension Service teams (two teams in year one, more teams in following years). The teams and the staff director will work together to design effective training and assistance programs for the targeted subsectors of the commercial sector, and then the teams will carry out the programs in their assigned territories. Consultant help will be used as necessary for detailed technical expertise.

The Conservation Extension Service program is modeled after an ongoing program in the state Department of Community Affairs (DCA), the aim of which is to motivate and train municipal managers and building officials to establish energy management systems in their localities. Note: (This DCA program is to be incorporated into the Extension Service program). The primary difference is that the Conservation Extension Service program will also include other subsectors of the commercial sector.

A detailed description of the municipal government program is the first presented below. This description describes the main features and expectations of the Energy Conservation Extension Service program, as it applies to energy use in municipalities. As mentioned earlier, detailed background work and planning, and a slightly different program plan, will be needed for each part of the commercial sector. Other target areas are discussed further below. The municipal government program is presented first because of the state's experience in this area, and because it presents the model for the program for other subsectors.

B. Municipal Governments

This component of the Conservation Services program will develop within local governments and within local school systems in Massachusetts the capacity to plan, organize, and implement an energy conservation program in municipally-owned and operated buildings. The services offered will be presented as a proven approach to achieving up to a 30% reduction in the energy requirements of these facilities from base year energy consumption prior to initiating a conservation program.

Participation of local governments and school systems will be solicited on the basis of the fiscal impact of this energy savings on the municipal and school budget. The services offered in this component focus on training local government personnel in the technical skills and management procedures that will enable them to sustain an energy conservation effort year after year. The content of the training will draw heavily from the materials in the Energy Management in Municipal Buildings, (prepared by the Department of Community Affairs), manual that stress the use Energy Budgeting, local Energy Conservation Managers, and Building Auditing techniques.

The training design is organized as a sequence of five sessions on technical or organizational aspects of the program that are interspersed with experience in the practical application of the techniques covered. The general objectives of this training sequence are: obtaining the policy and personnel and financial commitments at the executive level, which are essential to the success of the program over time; building the technical skill level of a local energy conservation manager to enable this person to assume program implementation responsibilities; creating highly visible models of successful energy conservation programs in municipal government and school systems which will motivate other local governments to participate in the program; establishing a relationship between the Conservation Extension Services unit and municipalities that provide a channel for broadening the scope of services to encourage the adoption of energy conservation policies and practices in other areas such as fleet management, land use, etc.

The training program will be organized on a regional seminar basis, enlisting the participation of from 10 to 15 municipalities that share a geographical proximity. The curriculum will be designed to build upon the strengths of small group interaction. Overall responsibility for maintaining staff support to the set of municipalities engaged in a regional seminar would be assigned to a single staff person designated as the regional liaison staff who would have access to full mix of technical skills available in the Conservation Extension Service unit to carry out the training design.

This regional model assumes 15 towns per seminar with an average of 15 facilities each, one half of which are schools.

It is estimated that the principal liaison staff will need to commit approximately 25 man days per regional seminar. An additional 15 man days of technical support staff time drawn from other members of the conservation services unit may be required for each regional seminar. It will be seen below that the design of the seminars includes an implicit follow-up program to monitor the steps taken by a municipality in its energy management program.

SESSION ONE: Program Initiation

*Objective/Audience: Motivate municipal and school officials to implement a phased energy-conservation program based upon developing local capacity with State support.

*Subject Matter: 1) General opportunities for conservation in local government operations, 2) Basic elements of a local energy management program (budget, audit, ECM), 3) Implementation (policy statements, press releases, selection of an ECM).

*Expected Results: Officials will initiate a local program by issuing a policy statement and appointing an ECM.

*Materials/Personnel: 1) Audio-visual presentation followed by interaction between staff person and local officials, 2) Package of materials to include sample press releases, policy statements, internal memos, etc., 3) Energy Management manual for ECM.

SESSION TWO: Energy Budgets

*Objective/Audience: Introduce/train local ECM's (designated after session one) in the preparation and first level interpretation of building energy budgets.

*Subject Matter: 1) Techniques for the collection of baseline information (fuel consumption and building area), 2) BTU conversions from fuel units, 3) Basics of utility rate structures, 4) Rule of thumb interpretation of consumption data and Energy Budgets, 5) Techniques for choosing buildings for energy conservation audits and measures (relating the budget to the measures), 6) Anticipating obstacles to measure implementation dealing with motivation and communication problems.

*Expected Results: ECM's will develop baseline consumption data, prepare energy budgets, and return for further training.

*Materials/Personnel: 1) Prepared workbook with illustration and examples of energy budgets, 2) case studies of budget-audit-measures from demonstration municipalities.

Session to be conducted by staff and, whenever possible, ECM's and officials from demonstration towns with successful programs.

SESSION THREE-FOUR: Principles of Energy Use/Building Audits

*Objective/Audience: Build technical capacity in ECM's to identify energy conservation opportunities and make limited assessments of potential energy savings using rule of thumb approach by holding a series of two discussions, each focusing on particular aspects of building operations or particular building systems (i.e. HVAC, Building Skin, Lighting).

*Subject Matter: In each session, the discussion will focus on 1) Factors that determine the energy consumption of particular systems, 2) Options for reducing consumption (no-cost and investment measures), 3) Recognizing appropriate measures and, 4) Estimating the payoff of an implemented measure.

*Expected Results: Local ECM's will have gained sufficient insight to identif first-level conservation opportunities in many buildings. Following these sessions (or perhaps incorporating them) the ECM's will accompany State staff in actual audits of a limited number of local buildings to demonstrate auditing techniques and conservation opportunities in the field. Subsequent to the demonstration audits, local ECM's can conduct audits in other local buildings.

*Materials/Personnel: Sessions will be conducted by staff and outside consultants using workbooks with case studies of particular measures and a suggested audit checklist. Demonstration audits to be conducted by staff with consultant support.

SESSION FIVE: Implementation Strategies

*Objective/Audience: Provide ECM's with techniques for successful implementation of local conservation programs after building audits have been completed.

*Subject Matter: 1) Communication of audit results with municipal and school officials to enlist support of measure implementation, 2) Communication of audit results with building operators and users, 3) Periodic monitoring of buildings to assure compliance with audit recommendations, 4) Reporting status of measure implementation regularly to key officials and department heads, 5) Determining conservation savings by using the energy budget.

*Expected Results: ECM's will be equipped to oversee implementation of conservation measures although continuing need for support from State staff should be anticipated. Future sessions may be scheduled to document and review the effectiveness of local conservation efforts.

*Materials/Personnel: Panel discussion with Staff and ECM's from the demonstration municipalities (i.e. people who have been successful), to address specific problems that may be raised or anticipated.

C. State Buildings

(1) Introduction and Background

In early 1975, Governor Dukakis directed the Executive Office for Administration and Finance, the agency having statutory authority over state-owned buildings, and the Energy Policy Office to determine how much energy could be saved in state offices and facilities and to develop a program to accomplish reasonable energy conservation goals. After studying the situation, it was decided that energy savings of 20% could be achieved in state buildings, and the Governor announced this goal at a public meeting in the fall of 1975. He also announced the beginning of an intensive effort to accomplish this goal.

The energy conservation program for state buildings began with a directive from the Secretary of Administration to each Executive Secretary to appoint an Energy Coordinator in each department and office within his or her Secretariat. These Energy Coordinators met for several weeks to discuss energy problems and to learn about energy conservation in general terms. Following these meetings, The Secretary directed that the Federal Energy Administration's Thermal and Lighting Guidelines be mandatory for all state buildings. In addition, the Energy Policy Office prepared a manual for energy conservation measures to be distributed to the various state agencies.

This ongoing program has established a good base from which the state will expand its conservation program as part of the overall state energy conservation plan. An important element that will prove valuable over the coming months is an established communication system between the Energy Policy Office and the Energy Coordinators at each state facility. In addition, a computerized monitoring system (to be discussed below) has been in the development stage for over one year and will become operational on February 1.

Enforcement and administrative responsibilities for the state building program lie with the Executive Office for Administration and Finance. Technical assistance and monitoring will be provided by the Energy Policy Office.

(2) Energy Management Plans

As part of the state building program, an energy management plan will be developed by the Energy Coordinator for every state-owned facility. Each plan must outline a well-defined and coordinated methodology for insure that energy conservation measures are implemented and adhered to in each state facility. The plans will include (a) a schedule for periodic surveys of each facility, (b) recommended operational changes to reduce energy consumption, (c) identification of potential capital improvements which could result in substantial energy savings--Note: (The state Legislature has appropriated $4 million for energy conservation capital improvements for the last and the current fiscal year. Other appropriations are expected in future years)--and (d) an energy conservation goal for each of the next three calendar years.

The energy management plans will be reviewed by the energy conservation teams of the Energy Conservation Extension Service. If adequate, they will be approved. If not, the staff will assist the agencies in formulating the final plans. The plans will serve an additional function beyond outlining the energy saving programs for the state facilities in that the plans will be used to evaluate the need for technical assistance and training at each facility.

(3) Training Sessions

To develop expertise in energy conservation and to instill confidence for developing and implementing programs, training programs and technical assistance, in the form of training sessions and seminars, will be provided to all Energy Coordinators. Training materials will be developed and training classes will be conducted by the Extension Service staff.

In developing the educational materials for this program, the staff will make use of energy walk-through audits, available literature, consultant studies, and other background investigations. There will be many opportunities for cross-fertilization with the other activities of the Extension Service staff, particularly those relating to privately-owned offices, hospitals, and other facilities.

(4) Monitoring

The New England Energy Management Information System (NEEMIS) project, funded by the New England Regional Commission, and operating by the MIT Energy Laboratory and the Sloan School of Management, is an important element of the state building energy conservation program. The NEEMIS system provides Massachusetts with energy monitoring and analysis capabilities. NEEMIS maintains data on historical energy consumption and expenditures for each state facility. Ongoing monthly energy data is supplied directly to NEEMIS, in computer compatible form, from the energy vendors that serve the state government.

The NEEMIS system will be used to produce a series of monthly energy consumption reports. Reports can be produced at various levels of aggregation, ranging from individual buildings, to departments, to the state government as a whole. In addition, the Energy Office maintains on-line computer capability so that unplanned queries can be formulated about the data and answered directly via a local computer terminal.

(5) Follow-up

The assessment of energy consumption patterns, obtained via the NEEMIS system, will be useful to the staff in further development of technical assistance programs. Also, in those facilities in which significant energy savings have not occurred, the Extension Service staff will initiate follow-up assistance, including refresher training courses and additional site visits.

(6) Summary

In summary, the state buildings program will be implemented by building-maintenance staff and energy conservation coordinators with the aid of the staff of Energy Conservation Extension Service, who will provide in-depth technical assistance to operators of state facilities. The vehicle for savings will be the energy management plan. A computer monitoring system, run by the statistician in the Division of Program and Policy Development, will be used to monitor the program and redirect efforts as necessary. Cross-fertilization with the other Energy Conservation Extension Service programs will be on an ongoing basis.

D. Other Subsectors

Data collected by the Energy Policy Office on energy consumption in the commercial sector indicates many opportunities for energy savings programs. In the first year of the state energy conservation program, the Energy Conservation Extension Service will direct its efforts at three prime areas:

(1) Office Buildings
(2) Retail Establishments
(3) Restaurants

In future years, efforts will be directed at other commercial subsectors, as well as at follow-up activities in the above-mentioned subsectors.

The energy conservation program for private firms will be similar to that for state-owned buildings and municipal facilities, in that technical assistance, training, and motivation will be the key aspects of this program. There will be differences, however, to reflect the characteristics of energy use in private facilities and to reflect different management procedures in the private sector. The key program elements are as follows:

(1) Baseline Studies

For each subsector, the Extension Service teams will undertake background research, pilot studies, demonstrations, and baseline evaluations to gain an understanding of the characteristics of the subsector. Manuals, brochures, and other educational and training materials will then be produced. These materials will probably be different from those prepared for municipal governments, in that the application of particular technologies is likely to be emphasized as much as energy budgeting techniques. (For example, typical configurations for heat exchangers in restaurants might be the subject of a given brochure for that subsector). The background research will investigate these areas, energy budgeting, and the need for improving performance of building operators.

(2) Dissemination

Following the preparation of materials, the Extension Service teams will undertake a statewide outreach effort to disseminate the information collected to the relevant subsector. Individual meetings, seminars, and conferences will be held in conjunction with industry trade groups, chambers of commerce, the state Office of Economic Affairs, and so on. The purpose of these sessions will be to motivate and inform businessmen of opportunities for saving and to promote a cross-fertilization of ideas among members of each subsector.

(3) Follow-up

There is a good possibility that some people attending the sessions mentioned above will request more detailed information and assistance. In these cases, the Extension Service teams will provide more detailed training. The purpose of the training for the private subsectors of the commercial sector will be to emphasize energy management techniques and analysis, rather than conducting in-depth studies of specific buildings. Business will be expected to rely on their own resources or paid consultants to perform the in-depth work for their firms. (This will not always be the case for the public buildings, where the teams will, from time to time, provide more extensive and specific services for a municipality or a state agency).

Another aspect of the follow-up effort will be an awards program. Firms will be invited to submit information on their energy savings achievements to the Energy Policy Office. Public award ceremonies will then be held to bring attention to those firms with successful programs. Besides offering firms a means to get publicity for their efforts, the awards program will give the Energy Office one measure of the success of the conservation program in achieving energy savings in a particular subsector.

The third aspect of the follow-up program is mentioned in more detail in the section on Program and Policy Development. This is a monitoring program based on a sampling of energy use in a number of firms in the state. This measure will assist the office in evaluating the overall effectiveness of its program. The results will be used also by the task force on mandatory standards, mentioned in the Program and Policy Development section. If voluntary programs are not sufficient to bring about the required savings, mandatory standards may be proposed.

E. Program Organization and Milestones

The Energy Conservation Extension Service will be organized on a team basis. For example, during the first year of the program, there will be two teams, one directing its efforts towards government facilities and businesses in the western part of the state, and the other focusing on the eastern part. In later years, additional teams will be added. There also will be a program director managing the Extension Service.

A major premise of the Extension Service program is that the different subsectors of the commercial sector, whether public or private, require somewhat similar information and assistance to develop energy conservation programs. The concepts of an energy conservation manager or coordinator, energy budgeting, life-cycle costing, and so on are common to virtually any conservation effort. The Extension Service, therefore, will direct its efforts at delivering those general messages within the context of specific subsectors. It is anticipated that the research and experience with public buildings will be applicable in many cases to private buildings; and vice versa. The state and municipalities undertake many of the same functions of private enterprise in similar structures (e.g. office buildings, sports facilities, hospitals, food service); and the use of one Extension Service for all of the subsectors will facilitate the transfer of information from one area to another.

As implied in the discussion above, the Extension Service will also retain a close working relationship with the Division of Program and Policy and the Public Education program, as well as with the programs run by the other state agencies.

It is anticipated that the Extension Service teams will devote one-third of their time to municipal government, one-fourth to state buildings, and the remainder to the private sector during the first two years of the state energy conservation program. This apportionment will be re-evaluated at the end of each program period. The following program milestones are anticipated.

E0700, PUBLIC INFORMATION AND EDUCATION

E0710 Program Overview

I. General Program Description

The purpose of the Public Information and Education program is to inform the public about conservation measures available to them and to encourage them to effect those measures by (1) providing background and historical information on why such conservation measures are necessary and how they can benefit people financially; and (2) outlining and explaining in detail specific conservation measures available, which will require moderate or low-cost investments, with quick pay backs.

The Energy Policy Office believes such programs to be vital to the overall and long-term success of all other conservation programs. Unless public attitudes and perceptions of conservation change substantially, the other programs outlined in the Conservation Plan will take place without the public support and understanding so vital to their success.

In order to design effective Public Information and Education programs, the Energy Policy Office has commissioned an in-depth public opinion survey to determine what the existing attitudes toward energy and conservation are in Massachusetts. Such an analysis is necessary in order to design the most effective information and education campaign possible. The survey will tell us what conservation activities have already occurred, how residents see the need for conservation, what attitudes and opinions block conservation efforts, and what the state can do to motivate people to change both their perceptions of energy conservation and their general energy consumption habits.

Once the survey is complete, public education and information programs will be developed to meet the needs outlined in the survey. There will be three basic programs developed: (1) a media campaign, using public service announcements on radio and television to educate consumers about the need for conservation and about what they can do to conserve; (2) adult education programs for both homeowners and renters to provide detailed and in-depth information to interested people on how to effect conservation measures in their homes, automobiles, and offices. The adult education programs will also offer an opportunity to reach large groups of people who may not yet be convinced of the need for conservation, provide them with personal and specific information on why conservation is necessary, and how they can go about making necessary changes; (3) Project Conserve II, which will consist of a toll-free hot line number, available to all state residents with energy-related questions. The toll-free number will also be used to provide homeowners with a free analysis of their home, patterned after the Project Conserve questionnaire and answer.

Effective conservation programs will be designed, based on the information provided by the public opinion survey which will (1) educate consumers about the historical development of the need for conservation in an effort to overcome existing resentment of the conservation message; (2) tell interested consumers how to conserve energy; (3) reach potentially interested consumers with a conservation message designed to meet their particular needs and to overcome their specific and personal objections to the idea of conservation. By combining the media campaign, the adult education courses, and the toll-free number in various ways, each will serve to reinforce and supplement the others in a coordinated and intensive public information and education program for the Commonwealth.

II Detailed Program Description

A. Media Campaign

Using the data provided by the public opinion survey, the Energy Policy Office will commission a series of public service announcements with appropriate conservation messages to be used on radio and television. The choice of specific media outlets will, to a certain extent, be determined by the information provided by the survey but will include the electronic media (radio and television) as well as possibly targeted print media. The number and subject of these public service spots will be decided after analyzing the results of the survey; there might be two or three major spots on why conservation is necessary, or a series of six to eight smaller spots aiming at altering specific objections to the idea of conservation by providing detailed information to counteract those objections. In general, the announcements will constitute a broad and coordinated effort to change both energy perceptions and energy consumption, to encourage conservation, and to inform people about the energy options available.

Program Plan:

June 30, 1977: Choose media firm to design and prepare public service announcements, in consultation with public opinion survey people and members of Energy Policy Office. Decide on number and topic of first round of media campaign and begin work on production of spots.

September 30, 1977: Begin distribution and airing of public service announcements in coordinated fashion, as determined by survey.

December 31, 1977: Contract and begin work on second phase of public service announcements to reinforce first phase. Continue distribution of first phase. Begin monitoring of all media outlets to determine air time, frequency of message etc.

March 31, 1978: Begin distribution and airing of second phase of public service announcements. Continue first phase of public service to reinforce second phase.

June 30, 1978: Continue airing of second phase of public service spots. Commission and begin second public opinion survey to measure effect of media campaign. First phase public service spots to be continued, but less frequently, as second phase takes over message.

September 30, 1978: Evaluate impact of public service announcements as revealed in public opinion survey. End airing of first phase public service announcements. Continue airing second phase public service announcements. Commission and begin work on second series of media spots, as determined by second public opinion survey.

December 31, 1978: Begin distribution and airing of new public service announcements. Continue airing phase two announcements to reinforce new series. Evaluate results of monitoring all public service announcements and tabulation of all letters and calls resulting from media campaign.

1979: Phase three and four (second series) of public service announcements to be aired. Terminate phase two announcements in June, 1979. Commission and begin work on field survey of energy consumption patterns and attitudes in late fall and early winter to measure impact of all outreach programs. (This last survey will be a field survey rather than a telephone survey and will be the most extensive and comprehensive public opinion survey done by the office).

1980: Using results of third and major field survey, commission and distribute and air a third series of public service announcements. Each new series of public service announcements will aim at certain target audiences, as well as the general public. Target audiences will be determined by the survey most recently completed in each case.

B. Adult Education

The Energy Policy Office will offer adult education courses in energy conservation techniques for the home through existing adult education vehicles in all local communities, through businesses, civic organizations, labor groups, and community organizations. Target groups for each outreach and publicity effort soliciting participants in the courses will be determined by the initial public opinion survey. In all outreach efforts, the Energy Office will aim at both those groups the survey indicates are most disposed to be interested in and sympathetic to the need to learn how to conserve, and those groups the survey indicates are least concerned about conservation. This way, the adult education program will both teach interested people concrete measures of energy saving and reach unconvinced or disinterested people with the preliminary message about the existence of such programs.

Conservation curriculum material to be used for these courses has been prepared already by the Energy Policy Office. Additional material will be developed and the existing material amended and expanded to meet needs expressed during the programs.

Once a continuing adult education program has been established, with mechanisms for outreach and publicity developed, the Energy Policy Office will begin work with state teaching colleges and the state agencies connected with them to develop an energy conservation curriculum for teachers. The intent of this program is to develop energy courses for teaching colleges so that newly graduated teachers will include energy in all curriculum material: energy as a science from grade school through high school; energy as a component of sociology courses in high school; energy as an element of all history courses from grade school through high school; and energy-oriented games for kindergarten through early grade school classes.

Program Plan:

June 30, 1977: Prepare and mail outreach brochure offering adult education courses in energy conservation to target groups, including (but not limited to) community and civic organizations, existing adult education vehicles, labor and business groups.

September 30, 1977: Complete training seminars for teachers of those groups which responded to the original mailing. Adult education courses to begin in early fall.

December 31, 1977: Mail evaluation questionnaire to all course participants and teachers.

March 31, 1978: Complete evaluation of courses based on response to questionnaire. Make appropriate changes in curriculum, teachers' training seminars, course structure, etc. as determined by evaluation. Begin second mailing of brochures offering adult education course to target groups, again as determined by survey. Add two or three specific groups not included in first outreach mailing. Begin work on energy curriculum for teaching colleges.

June 30, 1978: Complete training seminar for teachers of those groups which responded to second outreach mailing. Adult education courses to begin in autumn

September 30, 1978: Mail evaluation questionnaire to all participants and teachers of second course. Using both evaluations from questionnaire and the results of recently completed public opinion survey, target new groups for third mailing. Make whatever changes in course emphasis, outreach design, and curriculum necessary. Begin work with staff of state teaching colleges and related state agencies for demonstration program using newly developed energy curricula.

December 31, 1978: Mail third outreach brochure to newly targeted groups. Begin first demonstration program in energy curriculum for state teaching colleges.

1979: Begin full scale evaluation of demonstration program for teachers. Based on evaluation, begin full scale use of energy curriculum in all state teaching colleges. Offer newly developed teachers' curriculum in energy to all private colleges and universities offering education degrees. Continue and expand adult education courses based on last, in-depth field survey.

1980: Continue as above. Expand and refine teachers' courses in energy. Target new groups and organizations for mailing of brochures on energy conservation adult education courses.

C. Energy Information Clearinghouse

In order to facilitate the process by which state residents can obtain reliable and detailed information on energy conservation and in order to reinforce both the public service media campaign and the adult education courses, the Energy Policy Office will install and maintain a statewide toll-free number, available to all Massachusetts residents with questions relating to energy and conservation. All material prepared by the office, including all public service announcements and adult education brochures, will include prominant mention of this service. Students in architecture and/or engineering will be trained to handle all consumer questions with technical backup and assistance from the Energy Conservation Extension Service Teams.

To encourage use of the toll-free number, we will offer a special program via telephone: a phone-in Project Conserve. Under this program, a homeowner can call the toll-free number and give the student operator all the necessary data on his/her home (size in square feet, number of windows, inches of insulation, etc.). The student will record this data into a console computer as the caller is relaying it. The computer, which will contain all the data on

Massachusetts housing and weather characteristics fed into it for the original Project Conserve, will produce an instant Home Energy Report which can be discussed on the phone with the resident immediately and mailed to him/her as follow-up and for reference. This way, the caller can both receive the Home Energy Report and ask technical questions about that report in the same phone call. Further, offering a specific and obviously valued (judging from the response to the mail-in Project Conserve) service on the toll-free number will encourage residents to call that number and help to build the foundations of a long-range program of outreach and consumer education.

Based on both the initial public opinion poll and on a tabulation of questions most frequently asked by callers to the toll-free telephone service, the Energy Policy Office will prepare, print, and distribute brochures and information pamphlets on energy conservation for the public.

A major publicity effort will be made to ensure that as many people in the state as possible are aware of the toll-free number service. Aside from the established avenues (press releases, radio and television talk shows, press conferences, etc.), the Energy Policy Office will seek to make the toll-free phone service known through mailings to libraries, schools, businesses, labor unions, civic and community organizations, and other consumer phone services. In order to make the most effective use of our publicity effort possible, we will refer to the data provided by the original public opinion survey in designing the specifics of the outreach effort and will focus on a mix of target groups: those potentially interested in and prone to use such a service and those who do not yet perceive a need for such a service in their own lives. Through such a mix, we will guarantee that conservation measures are learned and implemented by those already interested and convinced and that understanding and awareness of the need for such measures will be somewhat increased on the part of those not yet interested in, or convinced of, the need for such measures.

The toll-free phone number will provide services other than the phone-in Project Conserve. However, the ability to offer a tangible and known to be popular service will greatly enhance the prospects of the toll-free phone and help increase its use.

Among the other services which the toll-free phone number can provide or can be expanded to provide, are: consumer protection service, by giving callers information on the energy efficiency of certain appliances, by providing callers with whatever information exists on quality and warranty standards for conservation devices, and by serving as a clearinghouse to handle and process complaints about conservation devices; residential conservation technical assistance, by explaining to callers how to implement simple conservation techniques or where to go to learn about how to implement more complex conservation techniques, informing callers where they can go to obtain conservation devices and equipment, and answering any technical questions on conservation which callers may have; and conservation coordination services, by keeping tabulation of the daily and weekly calls, operators and Energy Policy Office staff will be able to get a much clearer idea of the needs, both perceived and actual, of the consumers and develop programs to meet those needs. Through the toll-free phone, for example, the Energy Policy Office might develop a consumer cooperative to purchase energy conservation materials or to contract out for conservation retrofitting in a neighborhood. The toll-free phone is a flexible and expandible program component, which will grow and adapt to meet the needs of the consumers.

Program Plan:

June 30, 1977: Arrange installation of toll-free number. Train student staff to operate phone and computer. Target audience for advertising of toll-free phone's new availability. Prepare literature to disseminate at banks, shopping centers, community centers, etc. on phone service. (The public opinion survey will be used to help in targeting potential audience). Inform all conservation material manufacturers and dealers of the toll-free service and work with them and utilities in developing resource list for callers.

September 30, 1977: Gubernatorial press conference to announce new toll-free phone service, particularly phone-in Project Conserve. Target estimated calls to be received within first three months. Begin extensive publicity campaign, including radio and television talk show appearances, interviews with print media, press releases, and mailing to potential phone users as targeted by public opinion survey. (The public service announcement media campaign to be started at this time will reinforce message of toll-free number).

December 31, 1977: Prepare quarterly report, tabulating response to toll-free number: number of calls, kind of questions, how heard of service, demographics, etc. Compare tabulation with the target estimate of expected number of calls. After the first three months of the phone service, we will make decisions on the future of the program based on the response to date. If the response to the phone service is good and the estimated number of calls (or more) are received, then the service will continue using the outreach and publicity program previously developed. Publicity will be aimed at the needs expressed by the callers. If the toll-free number does not receive the estimated number of calls, the Energy Policy Office will refer back to the public opinion survey for assistance in developing a target audience mix. A newly developed publicity effort will be launched, including all outreach methods outlined above, plus new mailings designed to reach the targeted audiences. Based on the results of this new publicity effort for three months, a final decision on the program will be made.

March 31, 1978: Prepare quarterly report of calls. Based on results of second tabulation, make decision on whether to disband or expand program.

June 30, 1978: (Assuming program is continued) prepare quarterly report. Second public opinion survey will be started at this time, including questions on awareness of toll-free number, consumer needs which they think such a service could meet, etc. (The second phase of public service announcements, which began three months earlier, will include mention of the toll-free number, tying it to specific energy needs as discovered in the phone service and in the most recent opinion poll.

September 30, 1978: Prepare quarterly report on number of calls. Based on results of second public opinion survey, begin second round of outreach and publicity effort to make target groups more aware of service. (Again, media and outreach effort will include staff appearances on radio and television talk shows, public appearances at local events, print media interviews, press releases, mass mailings, dissemination of brochures in public places, and other such activities.) If necessary, revisions in the nature, services, and scope of the toll-free number service will be made depending on awareness and attitudes toward service expressed in poll.

December 31, 1978: Prepare quarterly report on calls. Based on 18 months of service, compile results of all quarterly reports. Evaluate breakdown of how and where people heard about service and re-think entire publicity effort based on that compilation. Terminate any publicity efforts which are not producing callers. Target two new areas of information which service could provide, but is not now providing. (Coordinate with most recent public opinion poll).

1979: Begin major publicity effort as redefined by last poll. Use vehicles proven most effective in tabulation and compilation of phone calls.

1980: Based on results of third in-depth field survey, revise and expand phone service. Using data from survey, target two new areas of information which phone service can provide to consumers and prepare backup for that service and publicity to inform people of new services available.

E0800, PROGRAM AND POLICY DEVELOPMENT

E0810 Program Overview

I. General Program Description

The purposes of the Division of Program and Policy Development are to (1) monitor energy consumption in the state and in the various energy-consuming sectors; (2) act as liaison between the Energy Policy Office and other state agencies involved in the state energy conservation plan; (3) conduct policy analyses and prepare recommendations for local, state, and federal regulation and legislation; (4) serve as staff to special task forces established within the Advisory Committee and with other parties; (5) monitor the effectiveness of ongoing energy conservation programs and make recommendations for modifications or for introducing new programs.

The Division will consist of a staff of four professionals, including one person familiar with data collection and statistical analysis, and one lawyer.

II. Detailed Program Description

Many of the programs within this Division will be ongoing through 1980. Others will be short, one-time projects.

A. Monitoring Energy Consumption

This will be an on-going effort. Each quarter, energy use information for the latest quarter will be compiled and compared to the comparable quarter of the previous year, adjusting for heating and cooling degree days, and other pertinent factors. Similarly, once each year, yearly information will be compiled to compare the energy consumption in successive calendar years.

The statistician will have primary responsibility for this task. He/she will develop a data collection program to ensure that pertinent information is collected on a regular basis. Gross energy consumption for the state and major sectors will be collected via traditional sources, e.g. the Federal Power Commission, Bureau of Mines, Department of Public Utilities, State Division of Corporations and Taxation. Energy consumption for subsectors such as school buildings, retail establishments, and office buildings will be collected using a sampling procedure. It will be the responsibility of the statistician to develop and implement the sampling procedure. It is likely that this procedure will include collecting information from energy suppliers as well as end users. In addition, information on selected areas, such as state buildings, will be collected on a regular basis--using the New England Energy Management Information System (see state buildings section of the Energy Conservation Extension Service Program).

The statistician will also work with the other staff members of the Division to formulate legislation as needed to facilitate the data collection and monitoring program.

B. Liaison with Other State Agencies

This function will be performed primarily by an intergovernmental liaison person on the staff. The purpose of this function is threefold. One is to review the progress of the various state agencies to make sure they are meeting their expected milestones and submitting required reports. The second is to ensure that there is constant communication between and among the Energy Policy Office and the other agencies; so that ideas for improvements in programs will be circulated to the appropriate people. Finally, this person will work on regulations and legislation affecting energy use in the state, making sure that the concerns of other agencies and groups are taken into account by the Energy Policy Office in its policy recommendations.

These functions will be ongoing. Each quarter, this staff person will revise the quarterly reports submitted by the other state agencies. Also, he or she will prepare a yearly report suggesting changes in program functions and scope. This yearly report will be used in the preparation of the next year's conservation plan.

C. Policy Analysis and Recommendations for Regulations and Legislation

These functions will be undertaken by the Division staff, working as a team. A number of topics are already anticipated. For example:

1. Hospitals. The Energy Policy Office has determined that while there have been substantial improvements in the energy efficiency of many hospitals in the state, in many cases, institutional barriers stand in the way of further energy savings. It is the goal of this program area to better define these institutional barriers and to make recommendations for regulating changes to give incentives to hospitals to make further energy improvements. The

Program and Policy Development Division will work closely with the state Rate Settin
Commission, the state Department of Public Health, the hospital associations, and individual hospital management organizations to evaluate and implement a number of possible changes. Some of these are outlined below.

a. The General Laws of the Commonwealth were recently amended to strengthen and better define the powers of the state Rate Setting Commission--the agency that regulates hospital rates for the state. The new law gives the Commission the authority to "specify standard systems for determining, reporting, and auditing the costs and charges of every hospital--including methods by which each hospital shall allocate its costs and revenues and shall record its assets, liabilities, units of service, and departmental data." The law also contains a provision for experiments and demonstration projects "to test the relative advantages and disadvantages of alternative methods of determining, reporting, and auditing the costs and charge of any hospital or hospitals or to promote, through financial incentives, the more efficient use of the personnel and facilities of any hospital or hospitals."

The importance of this new law is that it gives the state the opportunity to use its rate setting regulatory process to encourage greater energy efficiency in hospitals. One possibility under consideration, and being discussed by the Energy Policy Office, the Rate Setting Commission, and various hospital officials, is shortening the useful life of depreciable energy conservation items. This would enable hospitals to quickly recover the cost of capital expenditures dealing with energy conservation. Hospitals would, in effect, swap capital dollars, plus interest costs, for the energy expenses avoided; so there would be no net change in cash flow until the energy conservation improvement was written off. Another possibility is to permit the cost of energy studies to be a valid, reimbursable expense.

b. In another area, discussions will be continued with the state Department of Public Health as to the feasibility of amending the Certificate of Need process to allow for the expedited review of capital expenditures for energy conservation measures. (The "Certificate of Need" is the process by which the DPH reviews a proposed capital expenditure of $100,000 or more to determine if there is a community need for the expenditure and if this need is consistent with the statutory mandate that quality health care is being provided at the lowest aggregate cost to every person within the Commonwealth.) Discussions with the Department will also determine the feasibility of requiring life-cycle cost estimates for capital expenditures for new or renovated buildings as a condition of Certificate of Need approval.

c. Finally, an energy questionnaire has been prepared with the assistance of the Massachusetts Hospital Association for the approximately 170-180 private hospitals in the Commonwealth. The questionnaire will provide essential data on energy consumption by hospitals, as well as specific information on energy conservation steps that have already been implemented, whether structural changes or changes in energy consumption patterns. The energy questionnaire will provide the foundation for the possible implementation of energy budgets for hospitals. In the event that the development of energy budgets proves practicable for hospitals, the state Rate Setting Commission has agreed to monitor energy consumption per square foot and per bed as part of its charge review function.

It is difficult to predict exact milestones for this section because the program will be ongoing and very dependent on the decisions and activities of the quasi-judicial Rate Setting Commission, which must ensure that all parties' legal rights are protected, and on negotiations with other agencies and individuals. Quarterly reports, however, will be prepared on the progress made in each of the areas mentioned above.

2. Ventilation Standards and Other Health Code Changes. It is apparent that a number of items in the state's health code were developed without proper consideration of their impacts on energy consumption. An example of this is the ventilation standards for the various types of buildings. While the standards are modified from time to time--e.g. the school ventilation standard was changed a few years ago--it appears that there is often a lack of in-depth analysis of the energy implications of the changes. Also, changes in ventilation standards appear to be based primarily on engineering considerations alone, rather than in conjunction with medical considerations.

This is a crucial area in energy management for the state. The health code, through its ventilation standard, strongly affects the amount of outside air brought into buildings that must be then heated or cooled by the physical plant of the buildings. Outside air levels are prime determinants of energy use. To the extent these levels can be reduced, there will be a proportional energy use reduction in summer and winter.

From time to time, the state Department of Public Health asks for suggestions for revisions of the state health code. The Program and Policy Development Division will respond to or initiate requests for significant, energy-related changes in the health code. The Division will analyze the current ventilation standards and temperature standards in the code and will submit proposed amendments to the Department of Public Health. Other areas of the code will also be reviewed for possible action.

3. Legislation on Energy-Use Monitoring. Legislation will be prepared that will give the state government the authority to acquire energy-use information from vendors and users of fuels and electricity in the state. This will not include a reporting requirement; rather, it will allow the state to sample a number of users in various sectors to enable it to better monitor energy consumption in the state. Work on this project will involve the lawyer and statistician in the office. Work will include drafting legislation, discussions with legislators, attendance at legislative hearings, and so on. The ultimate success of this program will depend on legislative action.

4. Task Force on Mandatory Standards. While this state energy conservation plan is based, for the most part, on voluntary programs, training, and economic incentives; there is a possibility that there will be a need for mandatory standards beyond those included presently in the plan. For example, some retailers have indicated that they feel mandatory energy-use standards will be necessary in order to ensure that the sector, as a whole, acts to save energy. Without such standards, it is feared some stores would gain a competitive advantage from another store's conservation activities. A task force will, therefore, be established to review the question of mandatory standards. Membership on the task force will include representatives from various subsectors of the commercial sector, consumer group technical experts, and legislators. It is anticipated that the task force will take about one year to complete its work. The task force staff will consist of the Division's personnel. The final product will be a report containing recommendations for mandatory standards and draft legislation, as required.

5. Task Force on Tax Incentives. As in the case of mandatory standards, tax incentives for energy conservation are not presently included in the state conservation program. It is proposed that a task force, similar to the one mentioned above, study this issue and report on their findings. Ideas to be considered are investment tax credits, accelerated depreciation for energy saving capital improvements, income tax deductions, and so on. As above, the task force will be composed of interested and expert citizens, and it will be staffed by the professional staff of the Division. The final product will be a report containing recommendations for tax incentives and draft legislation, as required.

6. Landlord-Tenant Relationships. Fifty-one percent of the housing units in Massachusetts are rented. In many of these, the tenant is responsible for the energy costs related to his dwelling unit. The landlord's responsibilities include supplying a serviceable heating system and an appropriate living environment for the tenant. This division of responsibilities often acts to discourage energy conservation measures in rented housing. A landlord feels little or no incentive to make capital improvements or take maintenance actions that will save energy because he derives no direct benefit from doing so. The tenant, on the other hand, is not prepared to add to the value of property he does not own, even if it will save energy. A prime example of this phenomenon, brought out in the public hearings on this plan, is that of inspection and maintenance of oil burners in apartment buildings. Landlords have the responsibility for providing an operating heating system. It has been suggested that the responsibility be expanded to include a requirement for annual servicing and instrument testing of oil burners. The cost for this maintenance would be passed through to the tenants in their rents, but, in return, they would receive the benefit of lower heating costs. The Program and Policy Development Division will consider this and other possibilities for removing institutional barriers to energy conservation in rented housing, will decide whether legislation or new state regulations are called for, and prepare recommendations accordingly. In fulfilling this function, the Division will rely heavily on the advice and assistance of both landlord and tenant organizations to help ensure a balanced approach to the problem.

Similar landlord-tenant relationships are found in the commercial sector. Leases for office buildings often include a provision for pass-through of operating costs to the tenant. The result, as described above, is that neither the tenant, nor the landlord, has an incentive to make energy conservation improvements. There have been ways suggested to remove this obstacle. One possibility is to write commercial leases that permit the amortization of capital costs associated with energy conservation improvements to be passed through to the tenant as an operating cost. With such a mechanism, the tenant would benefit from lower energy costs and the landlord would set his capital costs back in a reasonable time period. The Division will investigate this kind of problem, as well as those for the residential sector, and will prepare recommendations as necessary. As above, the Division will rely on the cooperation and assistance of members of the commercial sector, both landlords and tenants, in reaching its final recommendations.

(The program will be ongoing with quarterly reports on its progress).

7. Bottle Bill. A recently released FEA sponsored study showed that 44 percent of the energy presently used by the beverage industry would be saved if 5 or 10 cent refundable deposits were required on all beer and soft drink containers and if the cans and bottles were returned at a rate similar to the current national average return rate for refillable bottles. The number of jobs nationally would be increased by a net of 118,000 jobs; Massachusetts' protional share would be over 3,000 net new jobs. Other in-state reports have also shown net job gains. The positive energy and economic impacts of the bottle bill will continue to be publicized and Administration support for the bill will be continued in the Legislature.

8. Incentives for Automobile Efficiency. Legislation is under consideration that would mandate a statewide automobile inspection and maintenance program to be run by private contractors for the state. While the main purpose of such a program would be to reduce automobile air pollution, a beneficial side-effect is a substantial reduction in gasoline usage.

Briefly described, an inspection and maintenance (I & M) program would consist of a yearly inspection in which pollutant emission levels are monitored. If the levels exceed certain limits, the owner must correct the defect and the car be retested. In areas of the country that have an I & M requirement, the vast majority of violating automobiles receive only a tune-up, most tune-ups being minor. The average cost of required repairs, according to data from several areas with such programs, is between $20 and $25, with fuel cost savings due to the repair outweighing the cost in most cases. In all areas with such programs, an upper limit on the cost of required repairs is set.

The average percentage of cars failing this inspection would most likely be between 10 percent and 15 percent of those tested.

The Division will support legislation that would tax automobiles according to weight or estimated miles per gallon. Several cities and states already have registration fees based on such factors. The purpose of such a proposal in the case of Massachusetts would be to encourage automobile buyers to purchase more efficient automobiles. The legislation might provide for no net gain in tax revenue, but rather for a shift of revenue source. In order to avoid driving Massachusetts buyers to out-of-state dealers, the tax would probably be sought as part of registration fees.

9. Utility Rate Reform. The state Department of Public Utilities is currently investigating peak period pricing and related rate reforms to determine their feasibility and applicability to Massachusetts' electric utilities. It is expected that this rule-making hearing will result in changes in the pricing structure for electricity.* The Division of Program and Policy Development will participate in this hearing by providing expert testimony and data to the Department at various points during the hearing when the Department requests such participation.

*These changes, in turn, can result in substantial amounts of energy conservation. On the one hand, rates that more closely reflect the cost of producing electricity will promote conservation by giving users a signal as to the true economic cost of power and energy. Also, shifts in consumption from on-peak consumption of off-peak consumption will result in fuel savings by the utilities, because generating units with lower heat rates will be used to produce electricity.

Milestones: Participation in the hearing will be on an occasional basis as determined by the Department of Public Utilities.

D. Overall Program Review and Planning

This will be an ongoing function of the Division. It will evaluate ongoing programs, review recommendations for changes in program schedules, and prepare reports to the Federal Energy Administration. It will also draw up plans for following years' conservation programs based on interactions with other agencies and other parts of the Energy Policy Office.

E0900, PUBLIC HOUSING

E0910 Program Overview

I. General Program Description

The Executive Office of Communities and Development is responsible for overseeing the management, by 225 Local Housing Authorities, of over 40,000 units of state-aided public housing in the Commonwealth of Massachusetts. The two largest housing programs are the Chapter 200 family housing program, with 15,000 units, mostly constructed during the period 1949-1953; and the Chapter 667 elderly housing program, with over 25,000 units created since 1960. Because of the variety of ways in which energy consumption in these units is metered and billed, no exact data is currently available on total energy consumption and costs in these units. However, at an average annual cost of $1,000 per unit per year for energy, the total costs for energy in all state-aided public housing would run to over $40,000,000 per year. Initial estimates made by the New England Energy Management Information System (NEEMIS) have indicated a probable savings that could be achieved through a comprehensive energy conservation program in the magnitude of 20% per year, or $8 million annually. The greatest benefits that would result from savings in energy costs would accrue to tenants: in projects where tenants pay their own energy costs, the benefits would be direct; in projects where the Local Housing Authority pays for energy costs, the savings that would result from energy conservation would enable the LHA to use the additional funds to improve living conditions in the projects.

In order to achieve the goal of energy conservation in public housing, the Department of Community Affairs is taking a number of steps. LHA budgets and operating statements are being computerized and will be statistically analyzed, including cost trends in energy-related line items, to determine typical costs and patterns of cost variations among LHA's. A recently completed inspection of all of the state's Chapter 200 projects will include in its final report a summary, for each project, of the major energy-saving improvements that could be undertaken at that project using Modernization funds. The Littleton, Mass., Housing Authority is experimenting with an off-peak heating system that significantly reduces total electricity costs. In Northampton, Mass., the LHA has received a HUD Solar Energy Demonstration grant to retrofit a congregate facility with solar panels. The Department is continually collecting information on energy consumption from utility companies in order to evaluate the impact of rising costs on LHA's and tenants who pay their own bills, as well as upon state public housing subsidy budgets.

In November 1976, the state Legislature approved an additional $50 million bonding authorization for the modernization of public housing, to be used over the next several years with a ceiling of $12 million per year. These funds will permit large-scale improvements to be made in public housing throughout the Commonwealth. The Department of Community Affairs, in implementing this program, intends to insure that local modernization programs include a high priority for improvements which would result in significant energy savings.

To that end, DCA has prepared the following programs to be included in the State Energy Conservation Plan. The Public Housing Energy Conservation Program will provide a public housing energy coordinator and staff as well as a variety of engineering consulting services, that would be primarily directed toward the objective of insuring that the $50 million to be spent by Local Housing Authorities over the coming 4-5 years results in significant energy conservation activities. The planning and management programs described below can therefore be expected to have a payoff in terms of energy conservation far out of proportion to the amount initially spent. In addition, because the Department and its field representatives and consultants will be working closely with LHA's and tenants in the years ahead to improve conditions in public housing, this represents an opportune time to carry out programs of tenant education in the area of energy conservation, since tenants will be able to see the benefits of programs which reduce energy costs both to LHA's and to themselves.

The following program outlines a multi-level approach that includes field research, impact studies, demonstration projects, training, educational programs, management system changes, and implementation of findings.

The obvious objective of this program to conserve energy is the saving of raw fuel and electric resources. Benefits, however, will accrue to tenants, DCA and housing authorities, such as:

- Cost savings accumulated as energy usage is reduced and as fuel prices continue to rise.

- Extension of the useful life of existing equipment and elimination of the need for early replacement.

- Increase the reserve capacity of central plant systems and transformers.

- Reduce the likelihood of shutdown or curtailment of services due to fuel or power shortages.

- Reduce airborne pollution resulting from combustion of oil and gas.

Throughout the program, close contact will be maintained between the Department of Community Affairs and the energy conservation staff of the Energy Policy Office to share information and combine resources in particular study areas. It is expected that a number of the measures analyzed by DCA will be of value to the Energy Conservation Extension Service and vice versa, and that a number of the Public Education programs will be of value to the overall DCA effort.

II. Detailed Program Description

A. Objectives

The primary objective of this program is to develop approaches and methods, including the application of new technologies, to reduce energy consumption and increase the efficient use of energy resources in public housing. Energy consumption in public housing refers to all sources of energy for heat, power and lighting consumed by local housing authorities or tenants. Energy refers to BTU's of energy consumed and not to dollars expended on purchased energy.

B. Methodology

Modernization Energy Investigation - The Modernization Inspection of Chapter 200 State-Aided Family Housing by the Department in September 1976 analyzes the major energy system components that have the most immediate potential for conserving energy. Selected work items were categorized in the inspection report as those having definite energy savings, probable energy savings, and less likely energy savings.

Outline - This energy conservation program is an expansion of what was learned from the Modernization Inspection. It will focus on those items identified in the inspection reports as having definite energy savings potential. It will document through a series of demonstration projects the actual amounts of energy that can be saved if certain work items are initiated. Many of these items are being considered as modernization activities. Therefore demonstration information can be collected as part of the modernization program.

The energy conservation program is a twofold approach toward the problem of reducing energy consumption in public housing:

- Retrofit the energy systems.

- Involve the tenants and management.

The natural tendency of any energy reduction effort is to focus on those systems and operations that consume energy directly -- boilers, furnaces, lighting, appliances, etc. This program deals with those issues, but also places an emphasis on the people who cause the energy to be consumed: local housing authorities and tenants. It is their use or misuse of heat, light and power that results in the high or low energy consumption patterns in public housing.

This energy conservation program is geared to study and implement its findings with dispatch. The program is directed toward achieving immediate as well as long range significant, effective energy savings. Buildings will be insulated; automatic controls will be updated; systems and equipment will be modernized; operating efficiencies will be improved; maintenance procedures will be expanded; and administrative programs will be developed. (Note: costs of materials will be paid for using state public housing modernization funds. As provided in the FEA guidelines, EPCA funds will not be used for equipment or construction.)

In addition to system retrofit, hard data will be collected through a series of field investigations, (Energy Conservation Activities) to put together a tenant and LHA incentive program that will encourage conservation of energy resources at their disposal. This part of the program is considered to be of equal importance, for without the cooperation of the user there will be minimal energy saved in the public housing. This program seeks both tenant and management input throughout the development, testing and implementation phases.

Background Investigations - This investigation procedure is a two stage process. First, before undertaking any specific energy conservation activities, information will be gathered by the Energy coordinator and consultants on previous studies and demonstrations relevant to energy conservation in public housing, including those conducted by Federal and state agencies, plus appropriate privately developed programs that may impact the energy situation in public housing. The various Energy Conservation Activities outlined later in this program may be modified by the findings of this preliminary investigation process before they are finalized for implementation.

Second, as each program is carried out, it will be further refined in order to determine its maximum energy saving potential. Specific design problems or innovative ideas will be noted.

Energy Conservation Activities - This program is a series of activities designed to gather information relative to energy savings and energy uses in public housing. This will include actual demonstration projects at pilot sites to record physical uses of energy and the changes that take place as systems are modified to effect conservation. It will also include inventory of records and management methods, study of maintenance activities as related to energy conservation.

Through the Energy Activities, this program concerns itself with the three systems affecting energy consumption in buildings:

- Energized systems, such as those required for heating, cooling, hot water, cooking, light and power.

- Non-energized systems, such as the building thermal envelope of walls, floors, roofs and windows.

- Human systems, including tenants, maintenance staff, operating and management personnel.

Each Energy Activity falls into one of the following categories:

- Energy Task Force and Background Investigation (Activity "a"). This activity is essential as it will coordinate all other activities.

- Activities where known significant energy savings will be achieved. Within this category, activities will be developed, implemented and compared to maximize the benefits of each concept, and to record actual energy savings.

- Activities, directly generated from the modernization inspection, that appear to have significant energy saving potential. These activities perhaps require more research (than those in Category 2) before implementation is undertaken. These activities are quite necessary if maximum information about reducing energy in public housing is to be obtained.

- Summary reports and alternate sources of energy.

Staffing (Part of Energy Activity "a") - An Energy Task Force will be set up as a subcommittee of the existing DCA Modernization Advisory Committee. The task force will be composed of representatives from DCA, local housing authorities, tenants and the public. It will provide input to the Modernization Advisory Committee on all energy related matters and will oversee the activities of the staff energy coordinator.

Within the DCA the position of a full time energy coordinator will be created to administer, and investigate the activities proposed in this Energy Conservation Program. The coordinator will receive feedback from each activity and modify or expand other tasks as results from studies and demonstration programs become available, and will research Federal regulations on energy conservation and advise the LHA's about their application.

The energy coordinator will be a person with experience in the field of mechanical engineering design as it relates to energy systems for residential, commercial and industrial projects, and will be familiar with the current state of the art in the area of energy analysis and knowledgeable of current energy legislation. Background in the area of management is desirable since much of the coordinator's activity will be administratively oriented in pulling together the various tasks involved with the energy program.

As the full scale energy program is launched, a full time technical staff assistant will be required to handle the initial volume of energy activities. The assistant will have a background in mechanical engineering as it relates to residential, commercial, and industrial projects. This background becomes necessary as the assistant will be involved with background investigations for each energy activity.

Finally, an assistant will be available to work full-time in the field with Local Housing Authorities and Tenant Organizations to provide them with information and technical assistance related to:

- routine energy conservation, and
- development of modernization work programs that give high priority to energy conservation items.

C. Results

At the conclusion of the demonstration phases, all activities will be reviewed by the Energy Task Force. Less successful activities may be modified by field experiences or by the results of other energy activities, redesigned and tested again on a pilot basis. (Energy activities designatec "w"). Successful activities will be implemented on a wide basis throughout the state as funds are made available or as modernization programs are carried out by the LHA's.

Each of the energy activities will report a series of optional directions that the activity may take depending on future fuel prices. The relationship between supplies and prices of the various fuels is continually changing and difficult to predict. Therefore a probability-of-events sequence will be introduced to cover these changing circumstances.

D. Implementation

It is already known at this time, through the modernization inspection and other investigations, that certain energy activities will have a drastic positive effect on the energy situation. The schedule of events calls for a report from each activity after the third month of its initiation, to advise the DCA and the LHA's on the energy impact of proposed modernization activities.

After the Evaluation phase the activities will move from pilot testing projects to development projects to be implemented at applicable housing sites.

Abbreviations used in this program -

EOCD = Executive Office of Communities and Development
DCA = Department of Community Affairs
LHA = Local Housing Authority
LTO = Local Tenant Organization
ERDA = Energy Research and Development Administration
EPCA = Energy Policy and Conservation Act
CHAPTER 200 = State-Aided Veterans Family Housing
CHAPTER 667 = State-Aided Housing for the Elderly
NERCOM = New England Regional Commission
D.U. = Dwelling Unit
DHW = Domestic Hot Water
HTG = Heating
BTU = Unit of energy measurement
British Thermal Unit

E. Listing of Energy Activities

a. Task Force, Staff and Background Investigations

An Energy Task Force will be set up as a subcommittee of the Modernization Advisory Committee and oversee the activities of the staff energy coordinator. Within the DCA, the position of a full-time energy coordinator will be created to administer, and investigate the activities in this energy conservation program.

The energy coordinator and his assistant will research all studies performed to date that relate to energy conservation in housing.

This activity is the "heart" of this energy program, as it will be the supervising and coordinating effort for all other activities.

The background investigation, in order to keep from duplicating past efforts, will investigate all applicable Federal, state and local organizations in the area of energy conservation. Studies have already been done, such as for insulation standards, equipment retrofit, alternate energy, etc., that may have useful input for the setup of the various elements of the energy conservation program for State-Aided Housing. The results of these investigations will modify and shape the detail of the other energy activities.

Research will be conducted at applicable agencies to collect data relative to each energy activity. Studies in the areas of residential and public housing energy conservation will be analyzed for input to the Commonwealth's State-Aided Housing Energy Program.

Any significant material obtained from these studies will be used to set up the various program elements. The list of activities will be reviewed to revise, delete and update, as required, to reflect the results of prior work. The energy coordinator will consolidate programs where appropriate to maximize the information gathered in each program.

These investigations, supervising, and coordinating procedures, are an ongoing process over the life of the total program.

b. Central Plant Retrofit

Refurbish a central boiler plant to current standards to improve system generating efficiencies and reduce energy consumption.

The modernization inspections revealed many central steam and hot water boiler plants that were using original 1950 generation equipment. In addition most of these plants have not received proper care over the years and are considerably run down. As a result it is estimated that fuel to steam efficiency is in the 50%-60% range.

This program will investigate the energy savings accrued by modernizing a central boiler plant.

E1000 WASTE OIL RECOVERY AND REUSE PROGRAM

E1010 Program Overview

The Waste Oil Recovery and Reuse Program will promote greater recovery and reuse of waste oil now discarded or utilized in an environmentally harmful manner.

Under Chapter 692 of the Acts of 1970, the Division of Water Pollution Control is authorized to administer regulations adopted by the Hazardous Wastes Board. (A copy of the requitisions and law, as ammended, is found in the Appendix.)

The present program for control of hazardous wastes, including waste oils, provides regulations which specify methods of handling and disposing of hazardous wastes and requires the licensing of firms engaged in conveyance, handling, and disposal of such wastes by the Division of Water Pollution Control. Under the present program, much waste oil is either burned, used for dust control on dirt roads, or thrown away.

The proposed program will focus on developing methods to recapture waste oil and on developing environmentally acceptable programs to reuse and dispose of waste oil. Public education will be a major portion of this program:

1. Energy Policy Office will develop programs to make the public more aware of Chapter 1162 of the Acts of 1973 (see Appendix), providing for the installation of waste oil retention facilities at all locations selling automotive oil. This law is intended to encourage people to return waste oil to the place of purchase so those waste oils can be picked up and properly disposed of and/or recycled.

2. The Energy Policy Office will develop public education programs for major industries, and for cities and towns.

It is expected that recycling as well as recapture will be emphasized, but the shape of this program is not yet clear. Further public education and demonstration programs may be necessary.

I. Description of Program Structure and Implementation

1. Description

The waste oil program will be implemented by the Water Resources Commission and the Division of Water Pollution Control of the Department of Environmental Quality Engineering (DEQE). The program will consist of five phases:

Task I:

Further identification of types, quantities, sources, and other characteristics of waste oil.

Task II:

Delineation of practicable recovery and reuse mechanisms.

Task III:

Identification of principal legal, technical, economic, and other barriers to the establishment of such mechanisms.

OTHER STATE PROGRAMS

This section describes other state programs included in the state energy conservation plan for which funding is not now being requested. These are programs initiated after December 22, 1975, which are to be credited to achieve the goal of reducing energy consumption in 1980. by five percent of projected energy use in that year.

E1100 PROJECT CONSERVE

I. Program Description

The Commonwealth of Massachusetts was the first state in the country to run Project Conserve on a statewide basis. The Commonwealth, with its 925,000 homeowners, served as the first of two pilot states for this homeowners' saving program.

The object of Project Conserve was straightforward, to assist homeowners to save energy and money by providing them with individualized, unbiased information on energy conservation techniques and materials.

While the program had been run in pilot cities in various parts of the country, the Massachusetts effort was the first statewide test. Competitive proposals from twenty-four states were submitted to the Federal Energy Administration in late 1975, and Massachusetts and New Mexico were chosen to run Project Conserve. The Massachusetts program began in March, 1976, with the New Mexico program following in the fall. In Massachusetts, the program was coordinated by the Energy Policy Office, the agency designated by Governor Michael S. Dukakis as the lead agency for energy conservation programs.

The core of Project Conserve was the homeowner's energy use questionnaire, a 29-question form requesting information on housing characteristics, energy use, and appliances. Upon sending in the questionnaire in a postpaid envelope, the homeowner would receive, within six weeks, a computerized Home Energy Report. The report contained energy conservation recommendations for attic insulation, storm doors and windows, weatherstripping and caulking, and lower thermostat settings, based on the characteristics of each house and local weather conditions. For each recommendation, the homeowner was given an estimate of its cost, its yearly fuel savings, its yearly dollar savings, and the payback period and return on investment.

The responsibilities for the program were divided between the Federal Energy Administration and the state Energy Policy Office. FEA was charged with printing and mailing the questionnaires to all of the single family homes in the state. FEA also was responsible for processing the completed questionnaires and mailing the resultant Home Energy Reports. In addition, FEA provided technical support to the state via two contractors who assisted with preparation of media materials (Grey Advertising, Inc. of New York City) and with training materials for volunteers and paid workers in the state (Bolt, Beranek & Newman of Cambridge, Massachusetts).

The state was charged with the local program functions, including the following: (1) operating a telephone hot-line and information and referral system; (2) conducting a media analysis and running a multi-faceted media compaign; (3) actively involving and soliciting the support of local community groups; and (4) monitoring the program's progress and making operational changes if necessary.

Massachusetts was allowed up to $215,000 by FEA for reimbursement for Project Conserve expenses. In addition, the state was required to contribute $29,000 as a matching share. As mentioned above, FEA bore additional expenses in printing, distributing, and processing the questionnaires, and in its technical support contracts.

As the program progressed, other state responsibilities were added to the Project Conserve contract. These were requested by Massachusetts and included programs designed to follow on and build on the questionnaire portion of the project. These additional programs were:

(1) Red Rover, a van equipped with infrared thermography equipment, which toured the state offering free heat loss scans of people's homes.

(2) The Little House of Big Energy Savings, a travelling exhibit displaying conservation techniques and equipment.

(3) Adult education courses, offered throughout the state, to teach homeowners more specific information about home energy conservation evaluation and improvements.

(4) Weatherization cooperatives, two studies to determine the feasibility of community-based group purchasing of energy saving materials.

All of these programs were completed within the original $215,000 budget allocation.

While each of the program areas suffered the occasional setbacks and problems typical of pilot efforts, the programs as a whole and individually were successful in achieving their purposes of informing and assisting homeowners with energy conservation techniques. In summary,

- Over 140,000 homeowners, or 15% of the state's 925,000 homeowners, completed the Project Conserve questionnaire and received Home Energy Reports.

- The Energy Policy Office received approximately 4,000 requests for the Red Rover infrared scan and was able to perform the scan for approximately 1,500 homeowners by mid-January.

- Approximately 3,000 people visited the Little House of Big Energy Savings during its three-month summer tour of the state.

- Adult education courses were offered in 80 communities in the Commonwealth.

- The Worcester weatherization cooperative succeeded in purchasing insulation materials for thirty families at an estimated savings of 25%. The Hyde Park program, in contrast was not a successful effort, but the feasibility study was valuable in determining the applicability of this concept to different types of neighborhoods.

E1200 WEATHERIZATION PROGRAM

I. Program Description

The state Department of Community Affairs and the 24 Community Action Agencies in the state have been involved in an extensive program to weatherize the homes of low-income families. The program, funded by the Community Services Administration and the New England Regional Commission, makes use of voluntary labor and C.E.T.A. - funded labor to install insulation, weatherstripping, caulking, storm windows, and other conservation improvements on low-income homes. The program will be continued over the coming year with additional NERCOM funds and F.E.A. funds. The Energy Policy Office will maintain close coordination with the Department to insure that educational materials and public information programs include aspects that will be useful to the Community Action Agencies in implementing their program.

E1300 LIFE-CYCLE COSTING

I. Program Description

On October 19, 1976, Governor Dukakis signed legislation requiring all public bidding authorities (i.e., the state, municipalities, public authorities) to include life-cycle cost estimates in bids for new construction. The state Bureau of Building Construction is directed to issue regulations defining the components of life-cycle cost estimates, and bidding authorities are directed to consider these costs in evaluating bids for new construction.

This law is a major step forward in public bidding practices. For the first time, the energy and other operating costs of a building will be considered as well as initial costs. The law will facilitate the inclusion of certain energy conservation and alternative energy measures that might otherwise not be considered because of high initial costs. A copy of the law is included for reference.